

INSULUX GLASS BLOCK

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A.I.A. FILE NO. 10-F

A.I.A. FILE NO. 10-F



American Stove Company, St. Louis, Mo. • Harris Armstrong, Architect • Photo: Hedrich-Blessing

DESIGN DATA AND GENERAL INFORMATION

1950

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Designed by Architects Holabird and Root and Burgee, this 11-story unit of Illinois Bell Telephone Company's long distance switching center houses intricate costly equipment. Insulux provides daylight, the insulation necessary for economical air conditioning, and helps block out dust and dirt in this structure at Clark and Congress Streets, Chicago, Illinois.

Basic Properties of Insulux Glass Block

Insulux Glass Block is used in thousands of buildings because of its superior light transmitting characteristics, its high insulation value, low sound transmission, its capacity to reduce air infiltration, and because of its permanence and low maintenance.

Light—Because Insulux Glass Block is a hollow glass unit having four surfaces into which designs can be impressed, it can be designed and made to direct and control the light which it transmits.

Insulation—High insulation value is an advantage in both summer and winter. Heat loss through glass block is less than half of that through windows. This means lower heating costs, greater comfort and less condensation on glass areas.

In summer, Insulux transmits less than half as much solar heat as single-glazed sash.

Permanence and Low Maintenance—Glass Block panels are built of durable glass and mortar with some steel reinforcing—minimum exposed steel, nothing to rot or corrode. They require no painting.

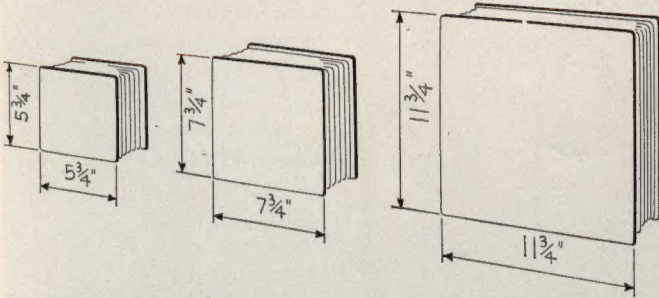
Infiltration—Properly installed, Insulux Glass Block panels eliminate almost all the infiltration of air, dust and dirt, thus reducing interior maintenance costs.

Sound Transmission—Glass block has a sound reduction factor that approximates the better class of fire-proof partitions.

● For detailed technical information see Pages 11, 26 and 27.

INSULUX GLASS BLOCK

Three Standard Sizes

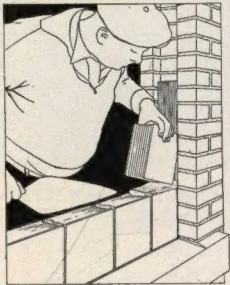


ALL 3 7/8" THICK

Insulux Glass Blocks are made in three sizes: 5 3/4" square, 7 3/4" square and 11 3/4" square, with supplementary corner and radial blocks.

Laid with 1/4" mortar joints, these sizes conform to accepted modular design systems. For complete information on designs and sizes, see pages 12 and 13.

Two Ways to Erect



1. SET-IN-MORTAR

The common method of erecting both interior and exterior panels of Insulux Glass Block is to lay the blocks in mortar. Their corrugated edges and rough mortar bond coating give the block a good "grip" on the mortar, making them easy to lay. When set,

the corrugations have a greater contact with the mortar than a straight surface, thus making a strong panel. Full details in specifications on pages 24 and 25.

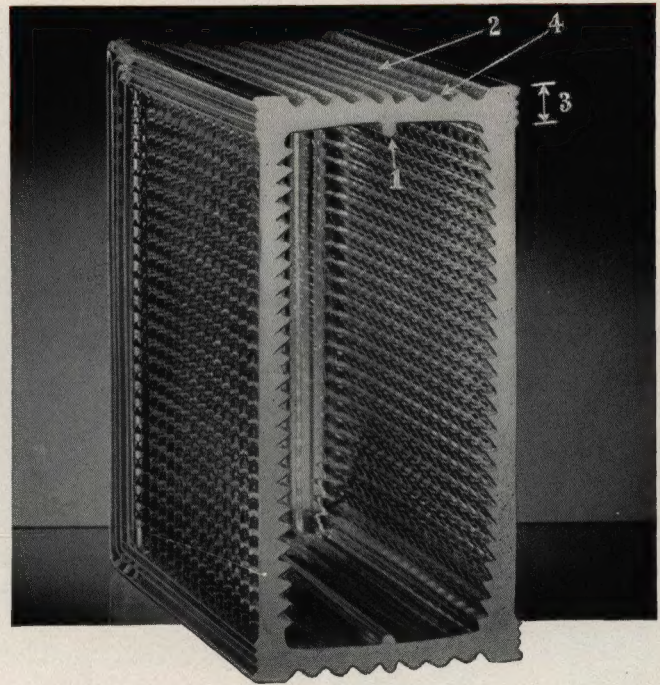


2. SET-IN-WOOD

(For Interior Partitions Only)

A prefabricated construction system, "Insulux set-in-wood", may be used in place of the conventional mortar for the erection of glass block in interior partitions. While panels so constructed do not have all the advantages—

such as a high sound reduction value and fire resistance—that panels set in mortar have, the system does permit easy dismantling and re-erection with complete salvage of block (see page 23 for erection details).



CROSS-SECTION OF BLOCK

1. Partially evacuated and hermetically sealed unit.
2. Corrugated bearing edges.
3. Rim prevents edge glare.
4. Mortar bond coating.

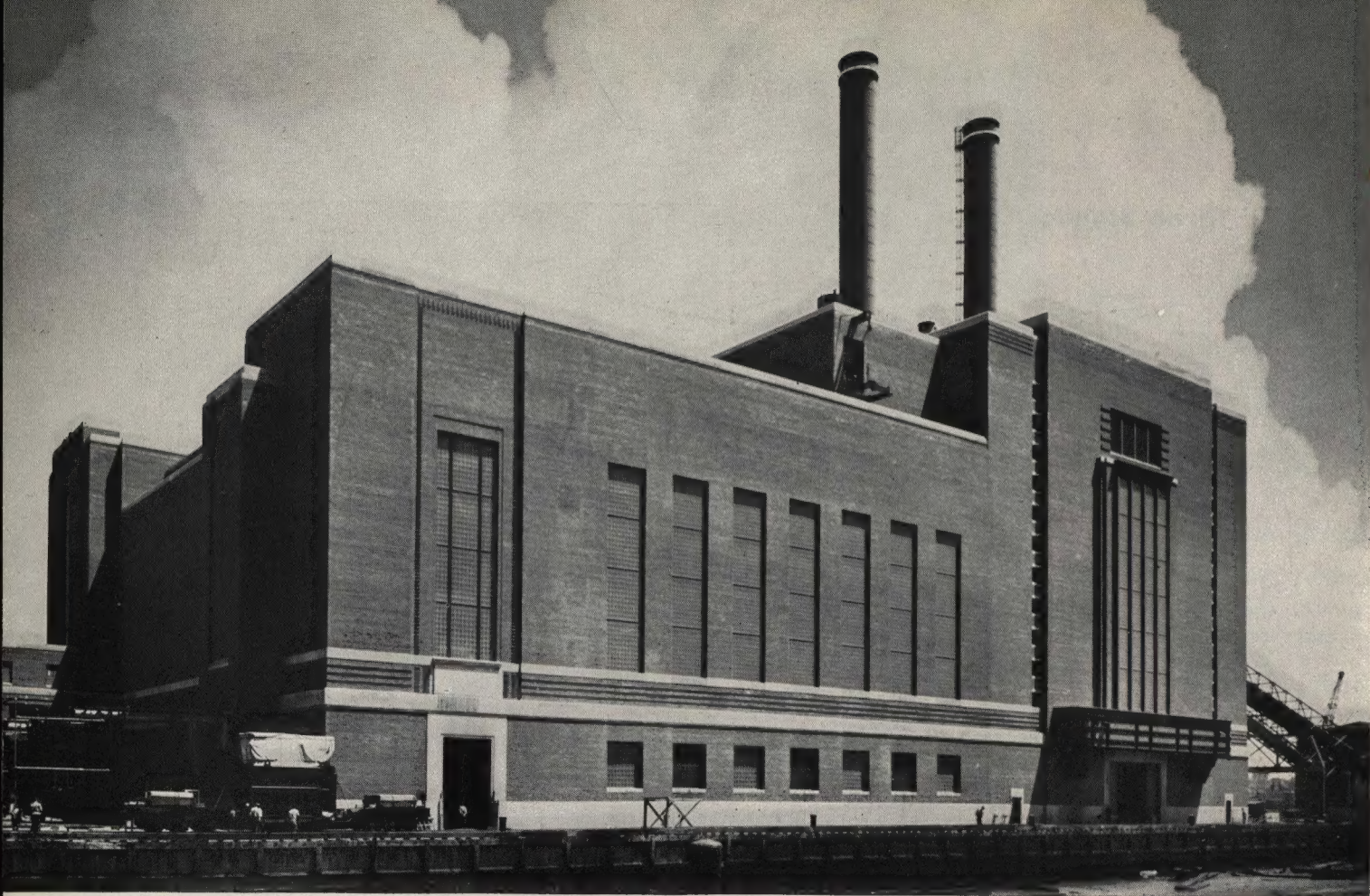
Description

Insulux Glass Block is a hollow, partially evacuated block made of water-clear pressed glass, hermetically sealed when manufactured. It is coated on the corrugated mortar-bearing surfaces with a gritty mortar bond.

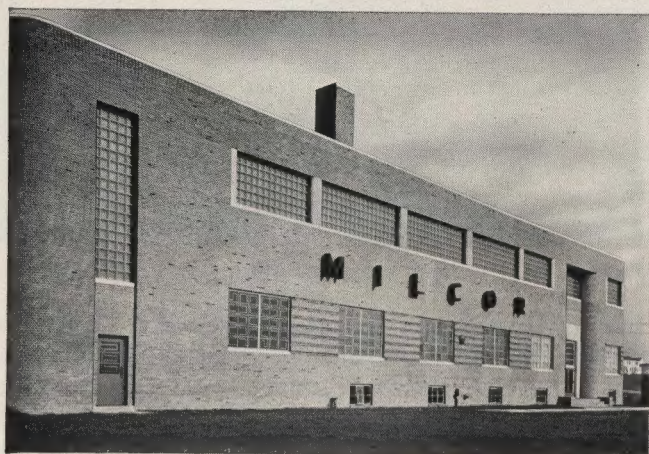
Insulux Glass Blocks are made in a variety of designs for functional, decorative or general-purpose use. Functional blocks control the direction of light as well as distribution and diffusion. Decorative blocks are used where design is most important. General-purpose blocks are for use where direct light transmission is required.

Acceptance

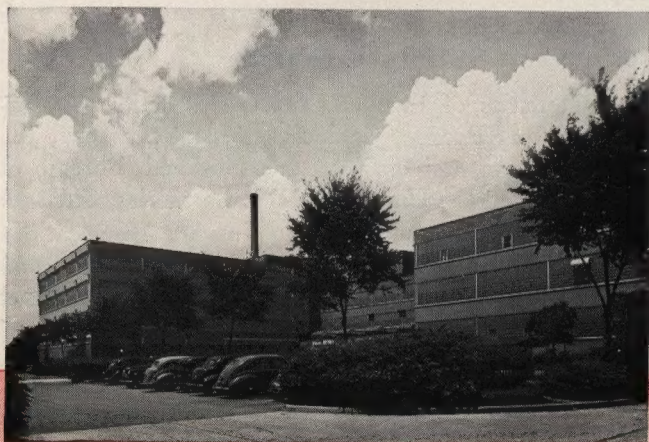
Characteristics of Insulux Glass Block have been investigated at Purdue, Columbia, Leland Stanford, Jr., and Michigan universities, the National Bureau of Standards and the Underwriters' Laboratories, Chicago. Official approval conforming to Insulux specifications has been given by code authorities in most cities and states; some West Coast codes require smaller panel areas and additional reinforcing.



Southwark Station newest link in Philadelphia Electric Co.'s chain of generating stations, is a model of advanced power plant design. One important construction feature is the use of almost 30,000 Insulux Glass Block. Ease of maintenance and permanence were deciding factors in this choice. Design by Philadelphia Electric Engineering Dept. with Paul Cret Associates consultants. General contractor: United Engineers & Constructors, Inc.



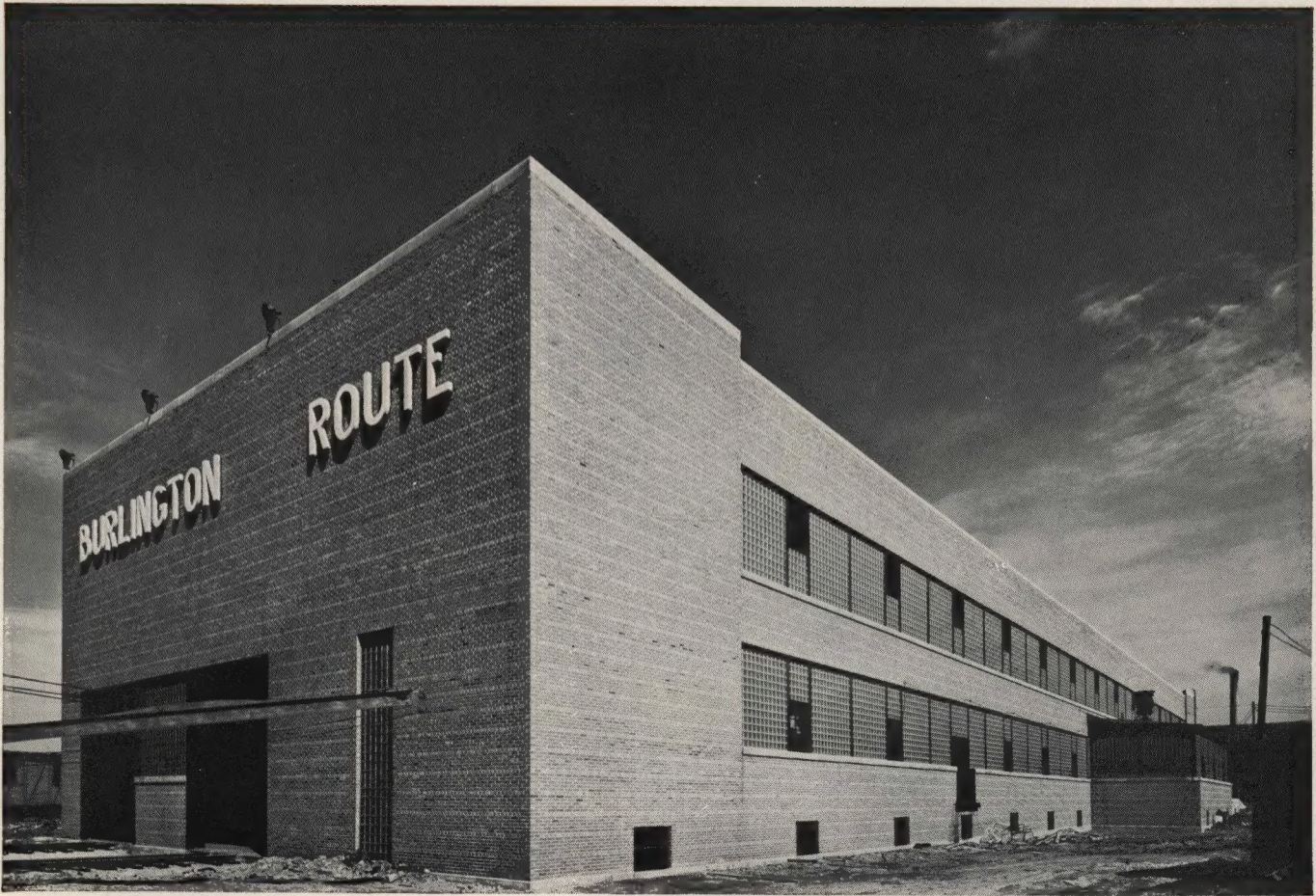
Milcor Steel Company at Baltimore, Md. Architects, James R. Edmunds, Jr., and Howard G. Hall.



Miles' Laboratories—well known manufacturer of proprietary medicine, Elkhart, Ind. Insulux Nos. 351 and 350 used.



Kansas Flour Mills—North Kansas City, Mo., recently replaced all their out-worn windows with Glass Block Panels.

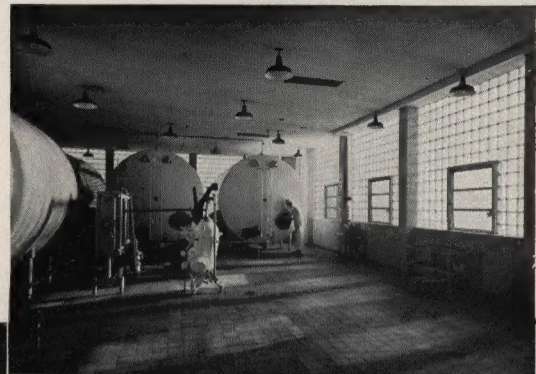


Diesel Repair Shops of the Burlington Lines, at Clyde, Ill.
Architect, C. B. & Q. Engineering Dept.

Light—Designers of Industrial Buildings can give their clients beneficial, economical daylight with Glass Block, and still maintain adequate control of inside temperature and humidity. No shading is required—daylight distribution is uniform, excessive glare is eliminated and shadows reduced to a minimum.



Grainer Room of International Salt Co. at Watkins Glen, N. Y., is well daylighted with Insulux. Despite corrosive atmosphere, glass block won't rot rust nor corrode.



Dean Milk Company, Huntley, Ill., interior and exterior. Permanence, sanitation and daylight. Architect, Victor L. Charn, Chicago.



Offices of Artek Pascoe, New York City. Ketchum, Gina & Sharp, N. Y. C., Architects.

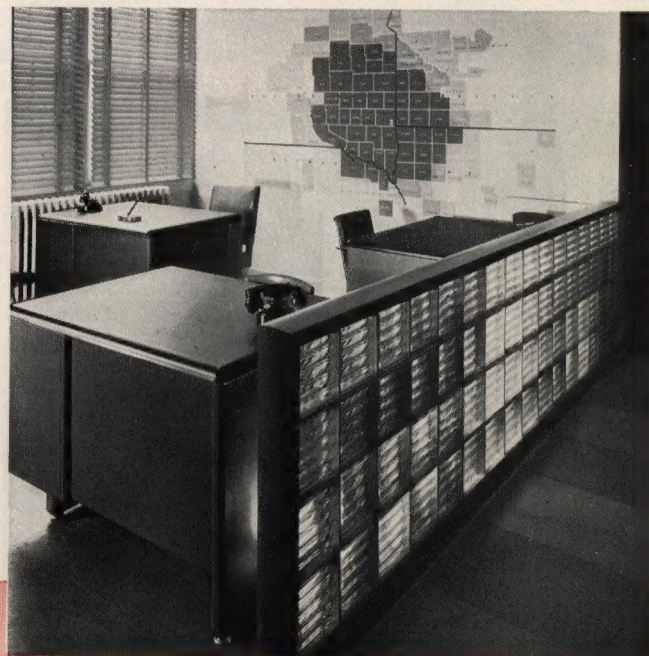


Fourth Northwestern National Bank, Minneapolis, Minn. Architects and Engineers, Lang and Raugland, Assoc., J. A. Brunet and A. H. Lange.

Privacy—Because it transmits light without sacrifice of privacy, Glass Block is ideal for offices and partitions. Small rooms can be made to seem more spacious and cheerful by building one or more walls of Insulux.



Waiting Room, Women's Clinic at Seattle, Wash.



Radio Station K500, at Sioux Falls, S. D., uses Insulux in its studios—because of high sound-retarding qualities.

INSULUX **GLASS BLOCK**



Bakersfield Sandstone Brick Co., Bakersfield, Cal.. Architect, Chas. H. Biggar & Associates.

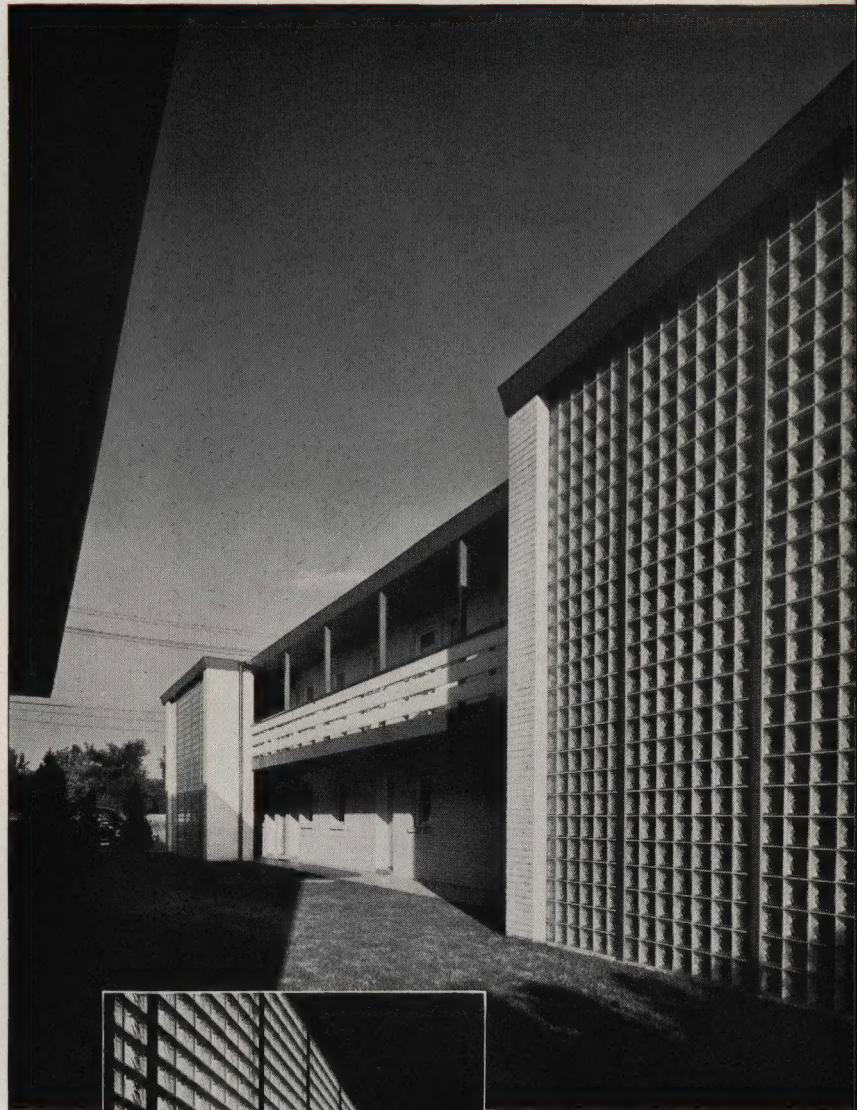


Offices of B. F. Goodrich Company, Cleveland, Ohio. Architect, Bonfield & Cumming.

Easily Maintained—The easy-cleaning qualities of Insulux promote a high degree of sanitation and cut redecoration costs. It keeps out dust and dirt, thus lowering losses through spoilage.



Poulsen & Nardon, Inc., Los Angeles, California. Architects & Engineers, The Austin Company, of Cleveland.



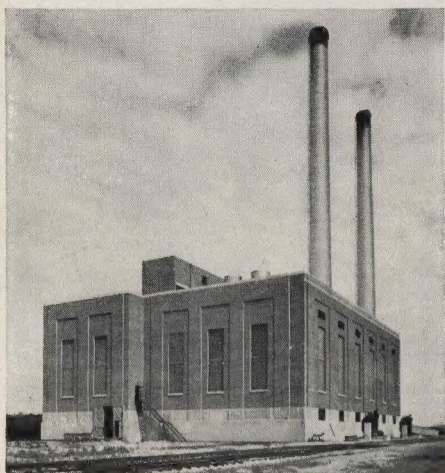
Three views of a Chicago apartment house using a glass block "screen" over stairs. Gives light without loss of privacy.



Apartment Building at 6107 N. Cicero, Chicago, Illinois. E. L. Anderson Company, Designers and Builders, Chicago.

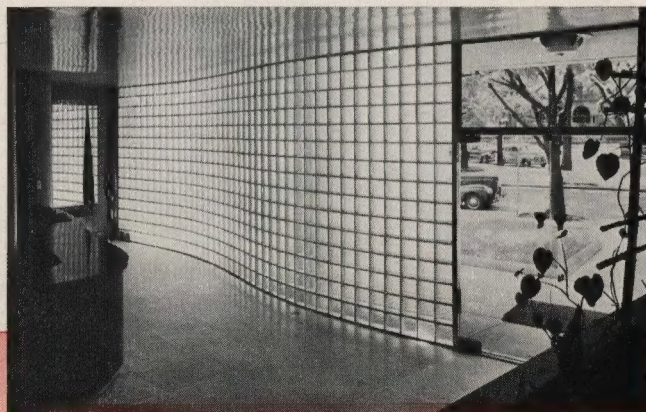


Bakersfield Hall of Records, Bakersfield, California.
Architect, Frank Wynkoop.

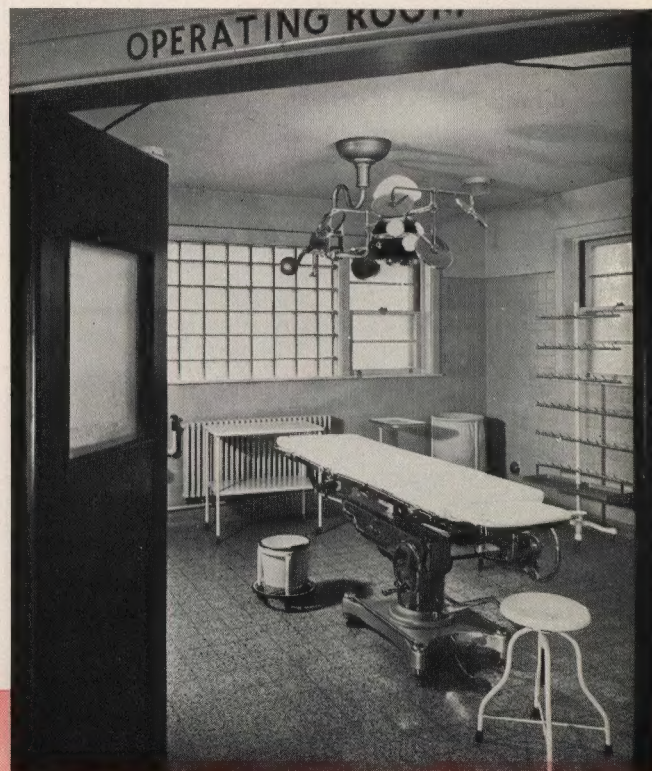


Hutsonville, Ill., Power Station. Engineers,
Sargent and Lundy, Chicago, Ill.

Public buildings, hospitals, power plants, filtration plants, armories, sewage disposal plants and service buildings find Insulux a permanent material that requires little or no maintenance.

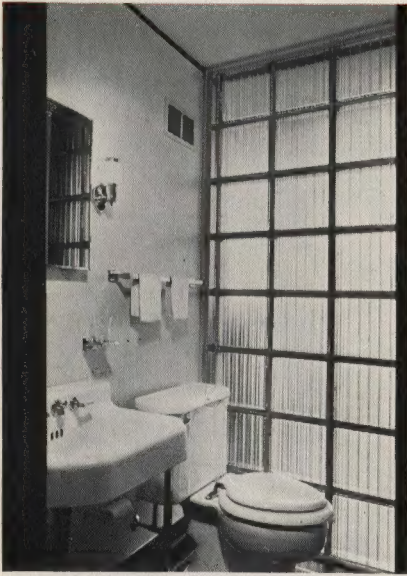


Croyden Apartments, Washington, D. C. Architects,
Berla & Abel, Washington.



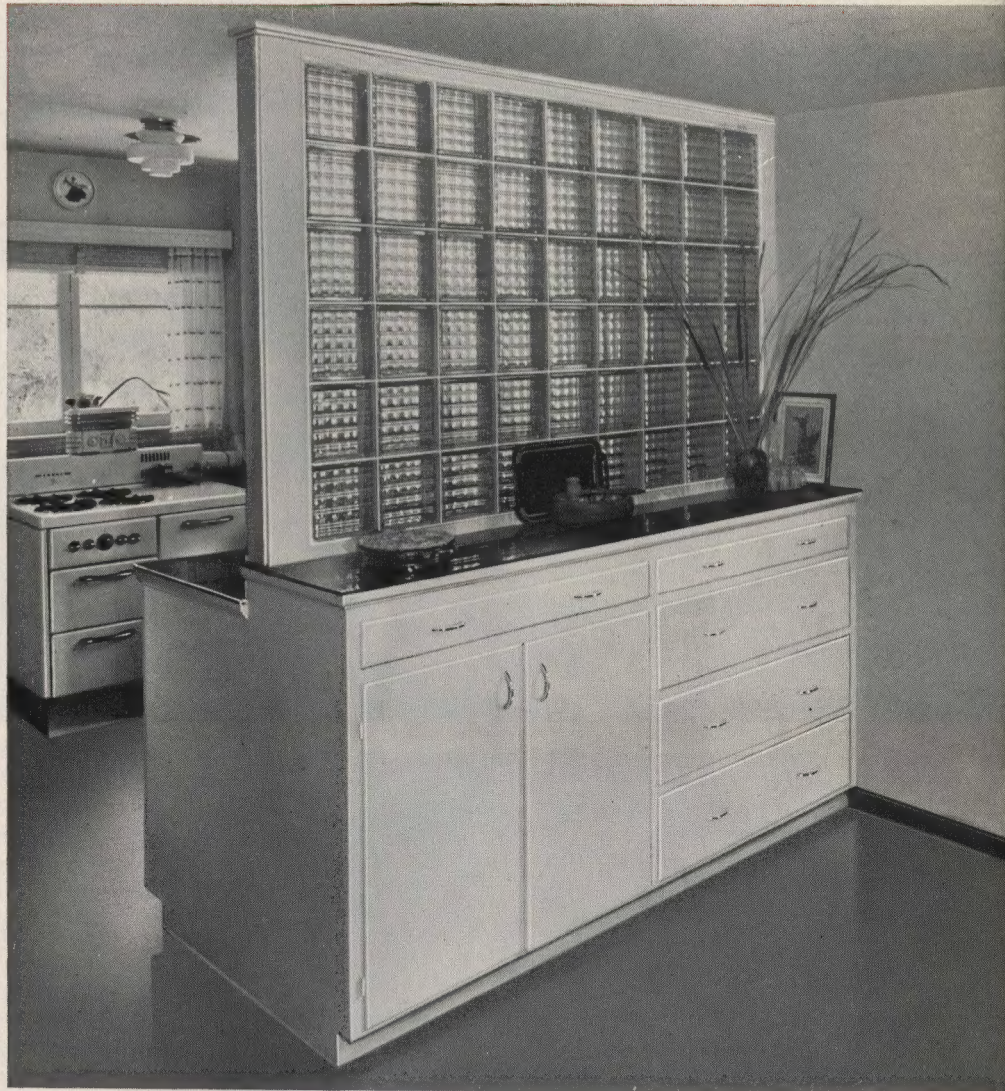
Sylacauga Hospital, Sylacauga, Ala. Architect, Chas.
H. McCauley, Birmingham.

INSULUX **GLASS BLOCK**



In the bath, Insulux is easy to clean. Ribbed-face blocks assure complete privacy.

Brighter Homes with Insulux Glass Block. Used in combination with windows it provides privacy—yet allows the larger total glass areas needed for modern and cheerful living.



Kitchens are lighter, brighter with easy-to-clean Insulux over the stove, over the sink or as a light-giving partition between kitchen and dinette.



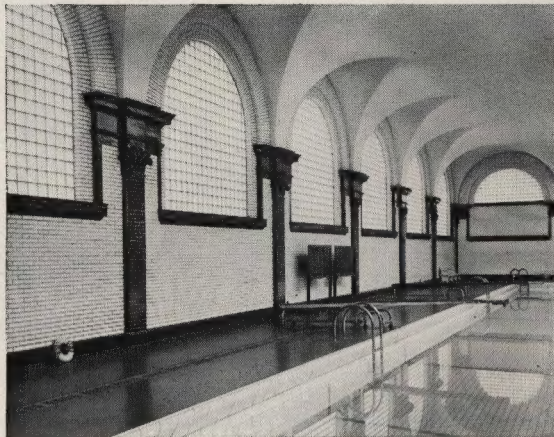
Basement Recreation Room can be lighted with panels of glass block set in area-ways.



Stair-landings and hallways with Insulux are cleaner, lighter—have fewer chilling drafts.



Interior Oakdale Christian School, Grand Rapids, Michigan. (Photo taken with supplementary lighting).



Swimming Pool at Culver Military Academy at Culver, Indiana.

Schools. The prismatic block described on the following page is recommended as the best means of bringing daylight illumination into school classrooms. Used above a clear vision strip as illustrated above, it is recommended as preferable to other constructions because principal illumination is directed toward the ceiling at all sun altitudes. It thus puts a greater proportion of its illumination deep into the room, and produces more even light distribution. Most important, it reduces interior brightness contrasts to a ratio much lower than conventional constructions.

Write for a copy of "Daylight in School Classrooms."



It resists breakage and gives evenly-distributed daylight for gyms, fieldhouses and auditoriums.



Exterior Oakdale Christian School, Grand Rapids, Mich. Architect is James K. Haveman, Grand Rapids.

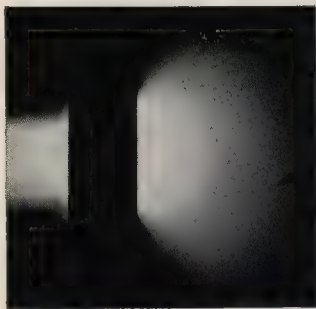
Utilization of Daylight

The problem of utilizing daylight is illustrated in (a) and (b) at the right. Photograph (a) shows a beam of light passing through a single sheet of glass, which does not control or change the direction of the light. Diagram (b) shows the effect of such lighting: too much light near the outside wall, too little at the far side of the room. To reduce the light to a brightness that can be tolerated, shading, painting or figured glass have been used as control methods. The result: questionable glare control, poor distribution and greatly reduced illumination.

No. 351 Prismatic Block

A new approach to the problem has been made by research at the University of Michigan. By utilizing the four faces of a glass block, patterns have been developed for accurate daylight control.

Picture (c) shows how prismatic block No. 351 changes the direction of the light, turning it upward. Picture (e) at left shows how block No. 350 diffuses light. Diagram (d) illustrates how these two blocks control light in a room. The No. 351 block used in the upper part of the panel direct the light toward the ceiling. The ceiling acts as a huge reflector to re-direct the light downward to the working surface. Because most of the light transmitted by this block is directed upward, the block viewed from below has a greatly reduced brightness.



No. 350 block spreads light evenly through horizontal plane.

No. 350 Block

Since the No. 351 block is designed for use only above the eye level, the lower part of the panel is constructed of Block No. 350. This block transmits somewhat less light than No. 351 but has a low brightness regardless of its location (high or low) in the panel.

Insulux Light-Controlling Glass Blocks are recommended for offices, laboratories, precision manufacturing plants and classrooms where lower brightness and control of daylight are of maximum importance. To secure the maximum efficiency with these blocks, upper walls and ceilings should be light in color.

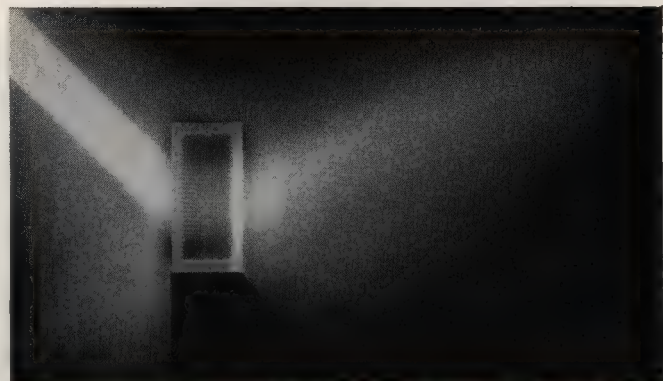
• Complete line of Insulux Glass Block designs is shown on pages 12-13.



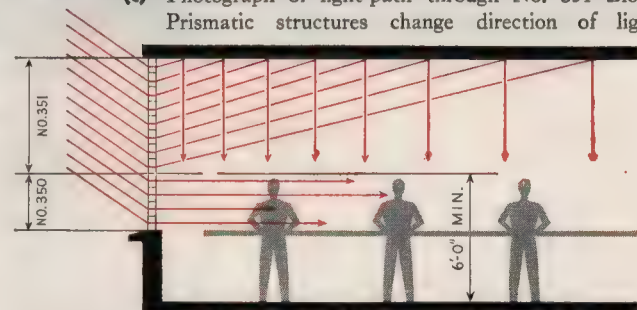
(a) Photograph of path of light through glass. Glass does not change the direction of principal beam.



(b) Light through window or unglazed opening. Distribution uneven. Shading is required to reduce glare.



(c) Photograph of light-path through No. 351 Block. Prismatic structures change direction of light.



(d) Red lines show how a combination panel of blocks No. 350 and No. 351 directs light. Light is well distributed, brightness of the lighting source, the panel, greatly reduced. Windows may be substituted for No. 350 block in the lower part of the panel if vision required.

DESIGNS, SIZES AND DESCRIPTION



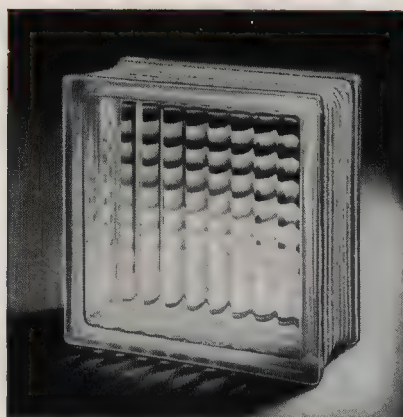
DESIGN NO. 7

An easily-cleaned, smooth-face block with parallel convex ribs on both interior faces. Gives high light transmission, limited privacy. No matching corner. Use corners 216-C, 316-C, Radial 316-R. Lay exterior ribs vertical to match corners and radials.

No. 207— $5\frac{3}{4}'' \times 5\frac{3}{4}'' \times 3\frac{7}{8}''$

No. 307— $7\frac{3}{4}'' \times 7\frac{3}{4}'' \times 3\frac{7}{8}''$

No. 407— $11\frac{3}{4}'' \times 11\frac{3}{4}'' \times 3\frac{7}{8}''$



DESIGN NO. 16

A smooth-face block with convex interior ribs running vertically one face, horizontally on the other. For decorative and lighting effects. Gives a fair degree of privacy. Lay exterior ribs vertical to match corners No. 216-C, 316-C and radial No. 316-R.

No. 216— $5\frac{3}{4}'' \times 5\frac{3}{4}'' \times 3\frac{7}{8}''$

No. 316— $7\frac{3}{4}'' \times 7\frac{3}{4}'' \times 3\frac{7}{8}''$

No. 416— $11\frac{3}{4}'' \times 11\frac{3}{4}'' \times 3\frac{7}{8}''$



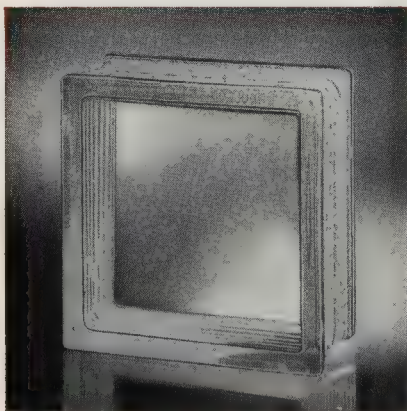
DESIGN NO. 17

A highly decorative, smooth-face block with concave flutes running vertically one face, horizontally on the other. Gives high light transmission with very limited privacy. Lay exterior ribs vertical to match corners No. 217-C, 317-C and radial 317-R.

No. 217— $5\frac{3}{4}'' \times 5\frac{3}{4}'' \times 3\frac{7}{8}''$

No. 317— $7\frac{3}{4}'' \times 7\frac{3}{4}'' \times 3\frac{7}{8}''$

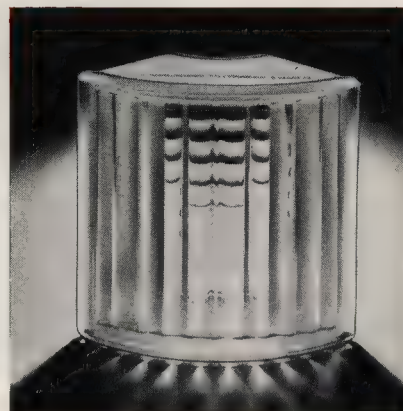
No. 417— $11\frac{3}{4}'' \times 11\frac{3}{4}'' \times 3\frac{7}{8}''$



DESIGN NO. 370

Both interior and exterior faces are smooth to permit a limited degree of vision thru the block. May be inset in other patterns for general vision to the outside, but must be shaded when used on sun exposures. In one size, $7\frac{3}{4}'' \times 7\frac{3}{4}'' \times 3\frac{7}{8}''$ only.

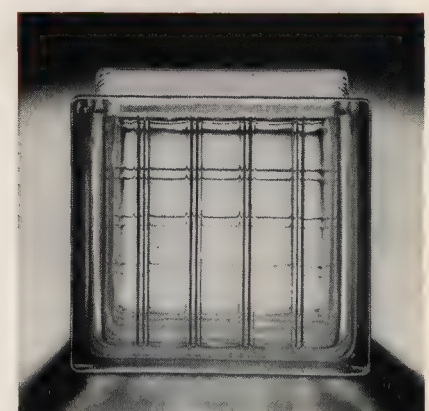
No. 370— $7\frac{3}{4}'' \times 7\frac{3}{4}'' \times 3\frac{7}{8}''$



CORNER BLOCKS

Designs to match standard block patterns listed below. Made in $5\frac{3}{4}''$ and $7\frac{3}{4}''$ heights only. All ribs are vertical on exterior faces. Use two $5\frac{3}{4}''$ high blocks with the $11\frac{3}{4}'' \times 11\frac{3}{4}''$ blocks.

200 SERIES ($5\frac{3}{4}'' \times 5\frac{3}{4}''$)	300 SERIES ($7\frac{3}{4}'' \times 7\frac{3}{4}''$)	400 SERIES ($11\frac{3}{4}'' \times 11\frac{3}{4}''$)
216-C	316-C	USE TWO
217-C	317-C	200 SERIES
230-C	330-C	CORNER
240-C	340-C	BLOCKS
	350-C	

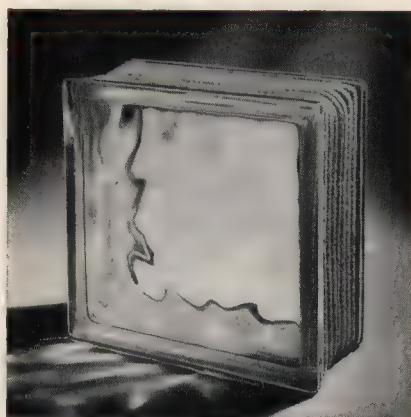


RADIAL BLOCKS

Designs to match standard block patterns listed below. For use with $7\frac{3}{4}''$ standard blocks only. Minimum radius 2'-5". Ribs vertical on long face. May be combined with standard blocks on long radii to reduce cost.

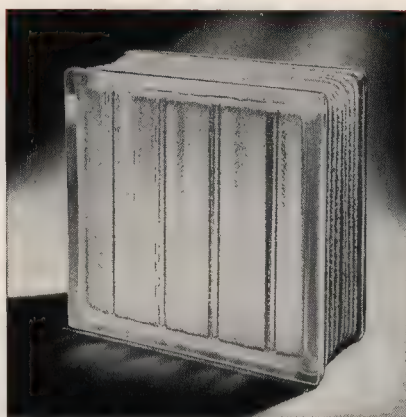
200 SERIES ($5\frac{3}{4}'' \times 5\frac{3}{4}''$)	300 SERIES ($7\frac{3}{4}'' \times 7\frac{3}{4}''$)	400 SERIES ($11\frac{3}{4}'' \times 11\frac{3}{4}''$)
NOT M'FD.	316-R	NOT M'FD.
	317-R	
	330-R	
	340-R	
	350-R	
	370-R	

INSULUX GLASS BLOCK



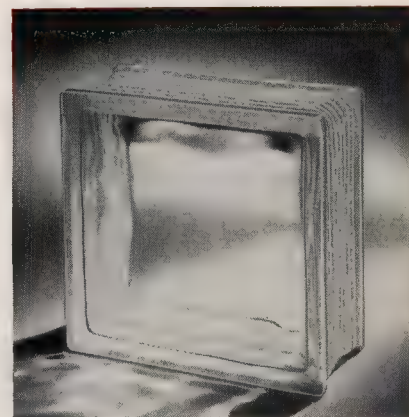
DESIGN NO. 30

A smooth-face, highly decorative pattern with high light transmission but a low degree of privacy. Distinctive design permits laying without regard to pattern. Has matching corner blocks, No. 230-C and 330-C.



DESIGN NO. 40

A ribbed face block offering a very high degree of privacy. Face ribs are shallow for easy cleaning. All four faces have parallel ribs. Both interior faces have stippled surfaces. Lay with ribs vertical to match corner blocks No. 240-C and 340-C.



DESIGN NO. 31

New design, "Random Clear" — varies slightly from block to block—gives effect of handmade glass. High light transmission, limited privacy. Use corners No. 230-C and 330-C. Lay in any position. Faces are smooth.

No. 230— $5\frac{3}{4}'' \times 5\frac{3}{4}'' \times 3\frac{7}{8}''$

No. 330— $7\frac{3}{4}'' \times 7\frac{3}{4}'' \times 3\frac{7}{8}''$

No. 430— $11\frac{3}{4}'' \times 11\frac{3}{4}'' \times 3\frac{7}{8}''$

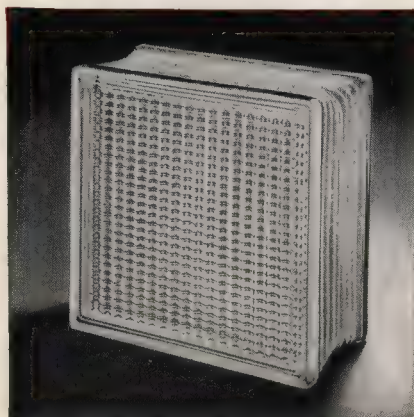
No. 240— $5\frac{3}{4}'' \times 5\frac{3}{4}'' \times 3\frac{7}{8}''$

No. 340— $7\frac{3}{4}'' \times 7\frac{3}{4}'' \times 3\frac{7}{8}''$

No. 440— $11\frac{3}{4}'' \times 11\frac{3}{4}'' \times 3\frac{7}{8}''$

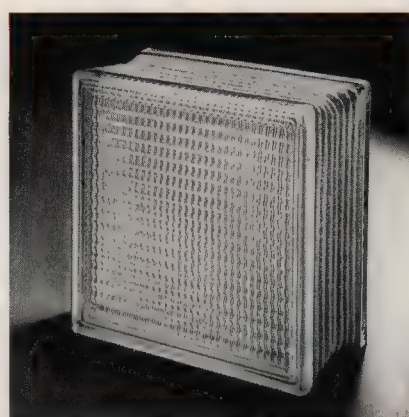
No. 331— $7\frac{3}{4}'' \times 7\frac{3}{4}'' \times 3\frac{7}{8}''$

No. 431— $11\frac{3}{4}'' \times 11\frac{3}{4}'' \times 3\frac{7}{8}''$



DESIGN NO. 350

Ribbed-face—designed primarily for severe sun exposures. Complete privacy. Use alone or combine with No. 351. Lay with exterior ribs vertical. One size: $7\frac{3}{4}'' \times 7\frac{3}{4}'' \times 3\frac{7}{8}''$. Matching corner No. 350-C, radial 350-R.



DESIGN NO. 351

A functional block designed to direct light above the horizontal, to the ceiling for reflection deep into room. Use above eye-level. Has vertical ribs on exterior faces. Lay only as marked. Made in one size only: $7\frac{3}{4}'' \times 7\frac{3}{4}'' \times 3\frac{7}{8}''$.

SPECIAL DESIGNS. Nos. 352 and 355 have a glass fiber screen sealed between the two halves. The No. 352 has the same face design as the No. 351, and the No. 355 the same face design as the No. 350.

The No. 354 is a standard diffusing type of glass block similar in appearance to Nos. 350 and 351.

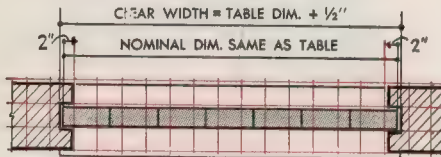
BLOCK DIMENSIONS

	200 SERIES $5\frac{3}{4}'' \times 5\frac{3}{4}'' \times 3\frac{7}{8}''$	300 SERIES $7\frac{3}{4}'' \times 7\frac{3}{4}'' \times 3\frac{7}{8}''$	400 SERIES $11\frac{3}{4}'' \times 11\frac{3}{4}'' \times 3\frac{7}{8}''$
SQUARE			
CORNER			Use Two 200 Series Corner Blocks
RADIAL			

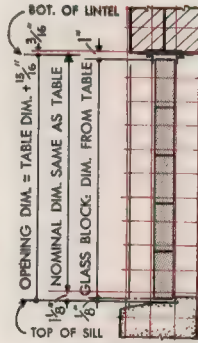
CONSTRUCTION DETAILS

Dimension Table

To determine clear opening size for glass block panels use dimensions given below and add $\frac{1}{2}$ " for the width and $\frac{15}{16}$ " for the height. For modular layout a $\frac{1}{4}$ " mortar joint is required.



PLAN



SECTION

No. OF UNITS	5 3/4" x 5 3/4"		7 3/4" x 7 3/4"		11 3/4" x 11 3/4"	
	HEIGHT OR WIDTH		HEIGHT OR WIDTH		HEIGHT OR WIDTH	
	1/4" JOINTS	3/16" JOINTS	1/4" JOINTS	3/16" JOINTS	1/4" JOINTS	3/16" JOINTS
1	6"	5 15/16"	8"	7 15/16"	1'-0"	11 15/16"
2	1'-0"	11 3/4"	1'-4"	1'-3 3/8"	2'-0"	1'-11 3/8"
3	1'-6"	1'-5 13/16"	2'-0"	1'-11 13/16"	3'-0"	2'-11 13/16"
4	2'-0"	1'-11 3/4"	2'-8"	2'-7 3/4"	4'-0"	3'-11 3/4"
5	2'-6"	2'-5 11/16"	3'-4"	3'-3 1 1/16"	5'-0"	4'-11 1 1/16"
6	3'-0"	2'-11 3/8"	4'-0"	3'-11 3/8"	6'-0"	5'-11 3/8"
7	3'-6"	3'-5 9/16"	4'-8"	4'-7 9/16"	7'-0"	6'-11 9/16"
8	4'-0"	3'-11 1/2"	5'-4"	5'-3 1/2"	8'-0"	7'-11 1/2"
9	4'-6"	4'-5 7/16"	6'-0"	5'-11 7/16"	9'-0"	8'-11 7/16"
10	5'-0"	4'-11 3/8"	6'-8"	6'-7 3/8"	10'-0"	9'-11 3/8"
11	5'-6"	5'-5 5/16"	7'-4"	7'-3 5/16"	11'-0"	10'-11 5/16"
12	6'-0"	5'-11 1/4"	8'-0"	7'-11 1/4"	12'-0"	11'-11 1/4"
13	6'-6"	6'-5 3/16"	8'-8"	8'-7 3/16"	13'-0"	12'-11 3/16"
14	7'-0"	6'-11 1/8"	9'-4"	9'-3 1/8"	14'-0"	13'-11 1/8"
15	7'-6"	7'-5 1/16"	10'-0"	9'-11 1/16"	15'-0"	14'-11 1/16"
16	8'-0"	7'-11"	10'-8"	10'-7"	16'-0"	15'-11"
17	8'-6"	8'-4 15/16"	11'-4"	11'-2 15/16"	17'-0"	16'-10 15/16"
18	9'-0"	8'-10 3/4"	12'-0"	11'-10 3/4"	18'-0"	17'-10 3/4"
19	9'-6"	9'-4 13/16"	12'-8"	12'-6 13/16"	19'-0"	18'-10 13/16"
20	10'-0"	9'-10 3/4"	13'-4"	13'-2 3/4"	20'-0"	19'-10 3/4"
21	10'-6"	10'-4 1 1/16"	14'-0"	13'-10 1 1/16"	21'-0"	20'-10 1 1/16"
22	11'-0"	10'-10 3/8"	14'-8"	14'-6 3/8"	22'-0"	21'-10 3/8"
23	11'-6"	11'-4 9/16"	15'-4"	15'-2 9/16"	23'-0"	22'-10 9/16"
24	12'-0"	11'-10 1/2"	16'-0"	15'-10 1/2"	24'-0"	23'-10 1/2"
25	12'-6"	12'-4 7/16"	16'-8"	16'-6 7/16"	25'-0"	24'-10 7/16"
26	13'-0"	12'-10 3/4"	17'-4"	17'-2 3/4"	26'-0"	25'-10 3/4"
27	13'-6"	13'-4 5/16"	18'-0"	17'-10 5/16"	27'-0"	26'-10 5/16"
28	14'-0"	13'-10 1/4"	18'-8"	18'-6 1/4"	28'-0"	27'-10 1/4"
29	14'-6"	14'-4 3/16"	19'-4"	19'-2 3/16"	29'-0"	28'-10 3/16"
30	15'-0"	14'-10 1/4"	20'-0"	19'-10 1/4"	30'-0"	29'-10 1/4"
31	15'-6"	15'-4 1/16"	20'-8"	20'-6 1/16"	31'-0"	30'-10 1/16"
32	16'-0"	15'-10"	21'-4"	21'-2"	32'-0"	31'-10"
33	16'-6"	16'-3 5/16"	22'-0"	21'-9 15/16"	33'-0"	32'-9 15/16"
34	17'-0"	16'-9 3/4"	22'-8"	22'-5 3/4"	34'-0"	33'-9 3/4"

Curved Panel Laying Radii

Either Standard or Radial Block can be laid to several radii by varying the thickness of the mortar joints. By combining both Standard and Radial in one panel various radii can be laid with a more uniform joint thickness.

Type "A" Panels laid with all Standard Block.

Type "B" Panels laid with all Radial Block.

Type "C" Panels laid alternating—2 Radial with 1 Standard Block.

Type "D" Panels laid alternating—1 Radial with 1 Standard Block.

Type "E" Panels laid alternating—1 Radial with 2 Standard Block.

BLOCK AND VERTICAL JOINT TABLE FOR 90° ARC OF A CIRCLE

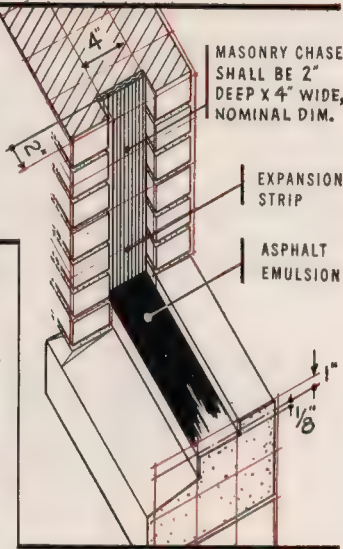
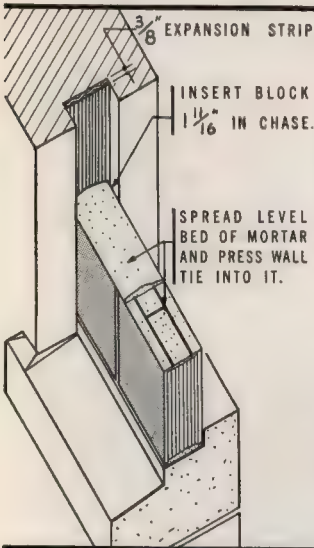
OUTSIDE RADIUS	NUMBER OF UNITS S-Standard R-Radial	JOINT THICKNESS		TYPE
		INSIDE	OUTSIDE	
7 3/4" STANDARD AND RADIAL BLOCK	2'-5"	5-R	1/8"	B
	2'-10"	6-R	3/16"	B
	3'-3"	7-R	3/8"	B
	3'-8"	8-R	7/16"	B
	4'-1"	6-R	1/8"	C
	4'-4"	9-R	5/16"	C
	4'-8"	10-R	9/16"	B
	5'-0"	8-R	7/16"	B
	5'-4"	6-R	1/8"	C
	5'-9"	6-R	1/8"	D
	5'-9"	7-R	3/16"	D
	6'-0"	7-R	1/8"	A
	6'-4"	6-S	1/2"	D
	6'-4"	7-R	3/8"	D
	6'-8"	14-S	3/8"	A
	6'-8"	7-R	1/4"	D
	6'-8"	15-S	1/4"	A
	7'-0"	6-R	1/8"	E
	7'-0"	16-S	1/8"	A
	7'-5"	6-R	1/8"	E
	7'-5"	17-S	1/8"	E
5 3/4" STANDARD BLOCK	7'-8"	6-R	7/16"	A
	7'-8"	17-S	1/2"	A
	8'-0"	6-R	5/16"	E
	8'-0"	18-S	5/16"	A
	8'-4"	7-R	1/4"	E
	8'-4"	19-S	1/4"	A
	4'-3"	13-S	1/8"	A
	4'-8"	14-S	1/8"	A
	5'-0"	15-S	1/8"	A
	5'-4"	16-S	1/8"	A
	5'-8"	17-S	3/16"	A
	6'-0"	18-S	3/16"	A
	6'-4"	19-S	3/16"	A
	6'-8"	20-S	1/4"	A
	7'-0"	21-S	1/4"	A
	7'-4"	22-S	1/4"	A
	8'-6"	13-S	1/8"	A

INSULUX GLASS BLOCK

Erection Procedure

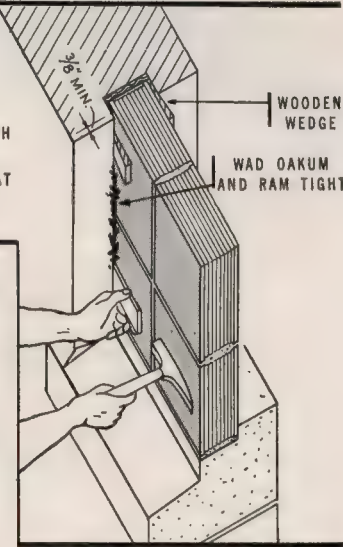
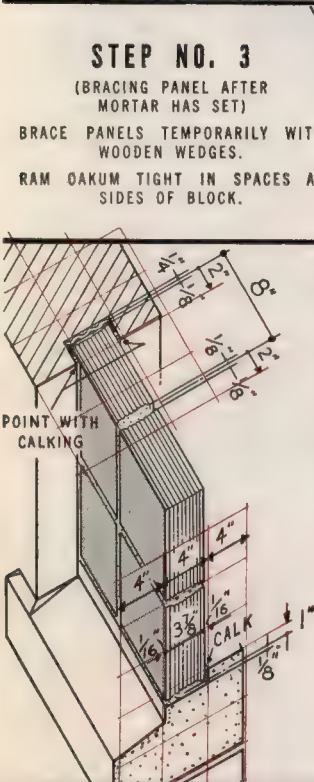
STEP NO. 1

(PRELIMINARY PREPARATION)
FORM CHASE OF SIZE SHOWN — IN
MASONRY OR BY METAL SHAPES.
APPLY ASPHALT EMULSION TO SILL.
APPLY EXPANSION STRIP CONTINU-
OUSLY AT HEAD AND JAMBS.



STEP NO. 2

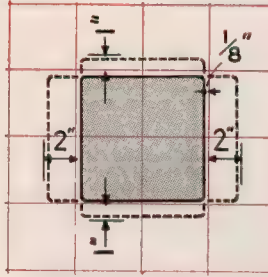
(LAYING INSULUX)
KEEP MORTAR OUT OF EXPANSION JOINT.
USE FULL HEAD AND BED JOINTS.
BED WALL TIE IN CENTER OF MORTAR
JOINT.



STEP NO. 4

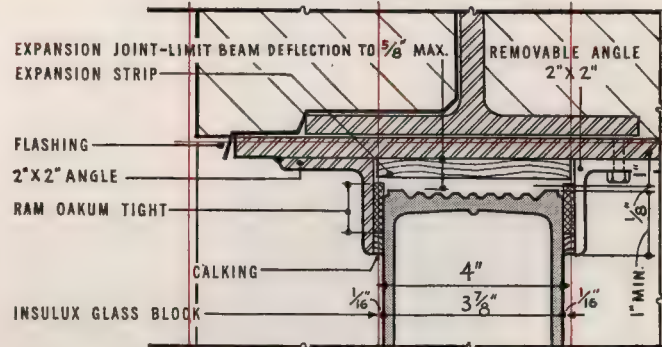
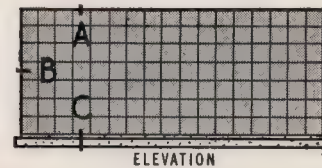
(CLEANING AND CALKING)
REMOVE WOODEN WEDGES.
CLEAN PANEL.
CALK TO DEPTH OF $\frac{3}{8}$ " MINIMUM.

Modular Coordination

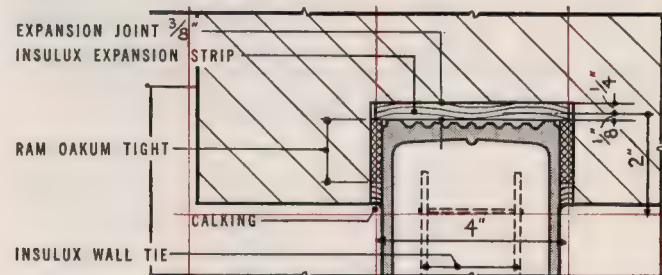


Details shown conform to ASA
project A62. Panel position
variable on grid lines; vertically
1" above or below, depending
upon sill detail. Horizontally it
may be on grid line or centered
between—depending upon jamb
detail.

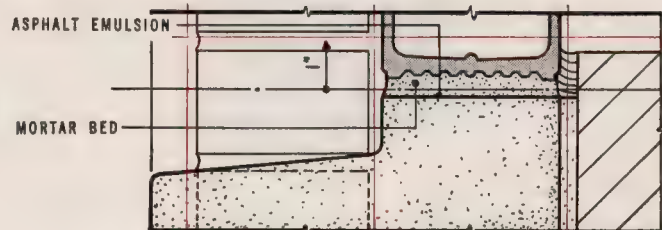
Panels in 12" Masonry Walls



HEAD SECTION "A"



JAMB SECTION "B"

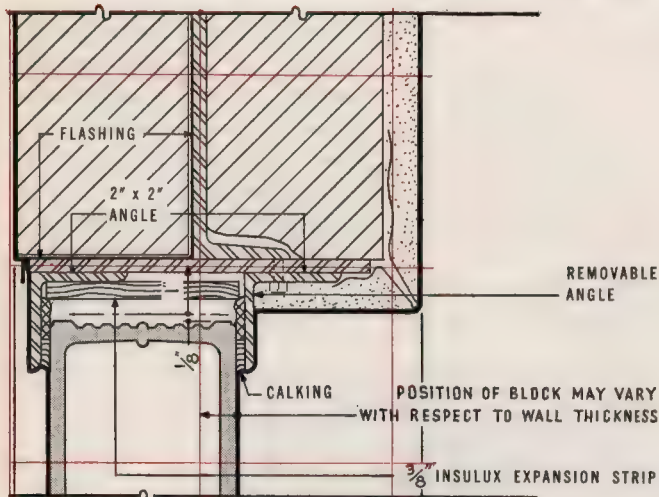


SILL SECTION "C"

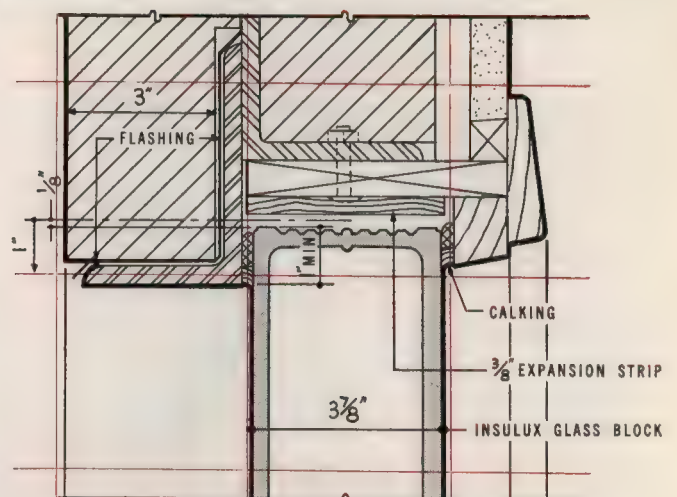
SCALE: 3" = 1'-0"

USE ABOVE IN CONJUNCTION WITH TYPICAL DETAILS AND SPECIFICATIONS

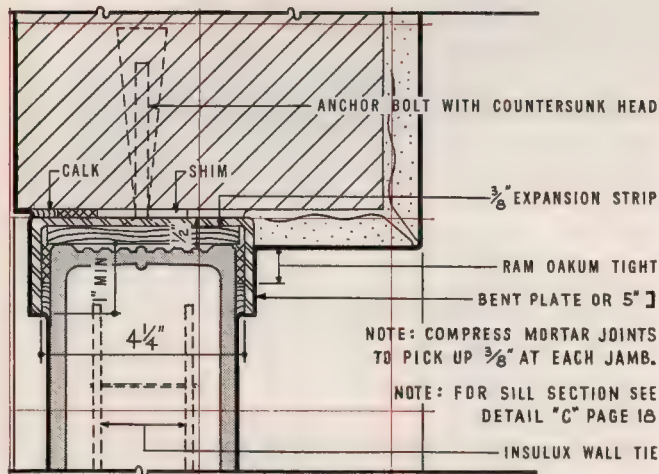
Panels in 8" Masonry Walls



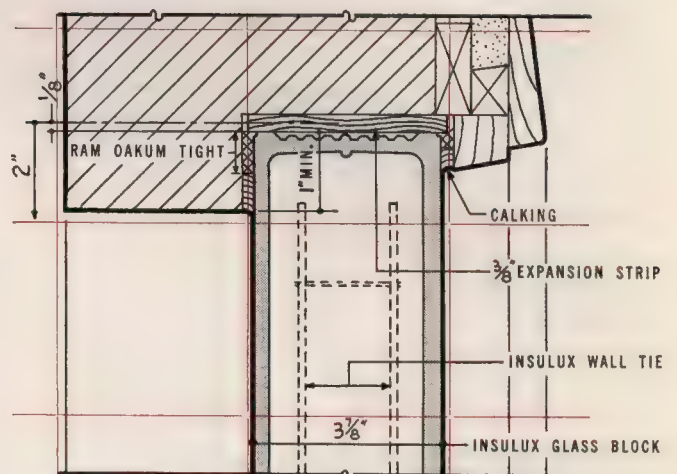
HEAD SECTION "A"



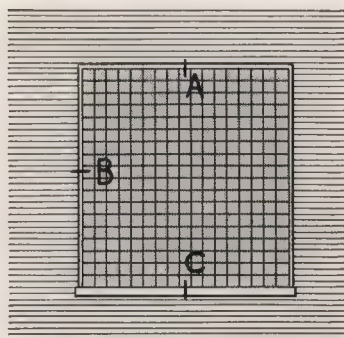
ALT. HEAD SECTION "A"



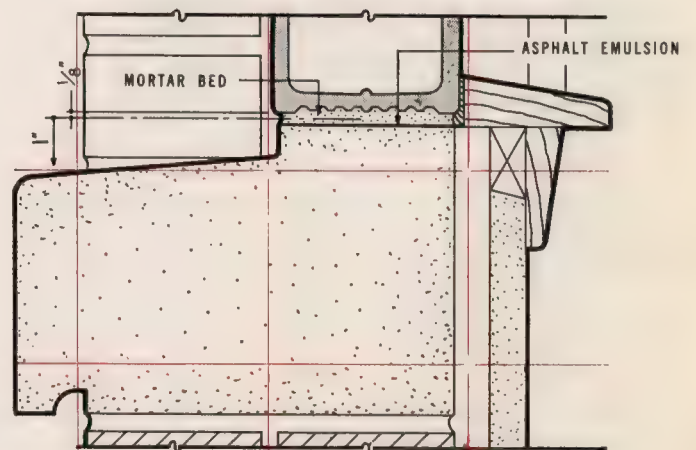
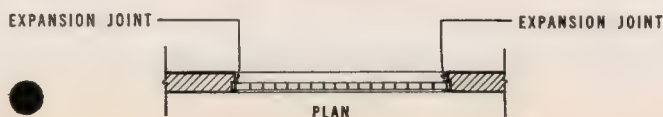
JAMB SECTION "B"



ALT. JAMB SECTION "B"



ELEVATION



SILL SECTION "C"

Intermediate Reinforcing for Large Panels

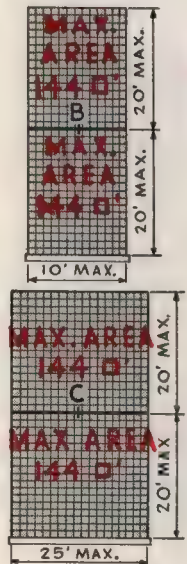
Exterior Panel Sizes and Areas

Sizes: Max. Length—25 Ft., Max. Height—20 Ft. Panels over these limiting dimensions shall be divided by mullions, detail "A" or shelf angles, detail "C" or "B," to provide expansion joints and reinforcement against wind pressure.

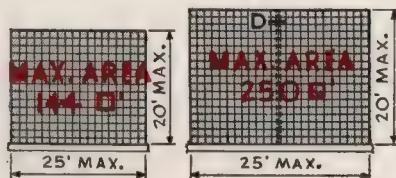
Areas: 144 Sq. Ft. (without stiffener)—250 Sq. Ft. (using stiffener detail "D"). Panels over these areas to be reinforced with mullions, detail "A", or shelf angles, detail "C" or "B".

EXAMPLES

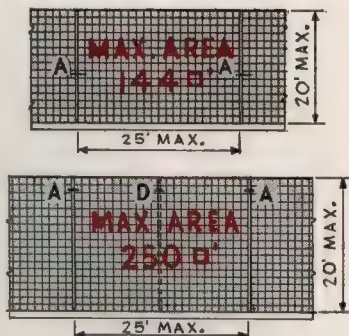
TALL PANELS



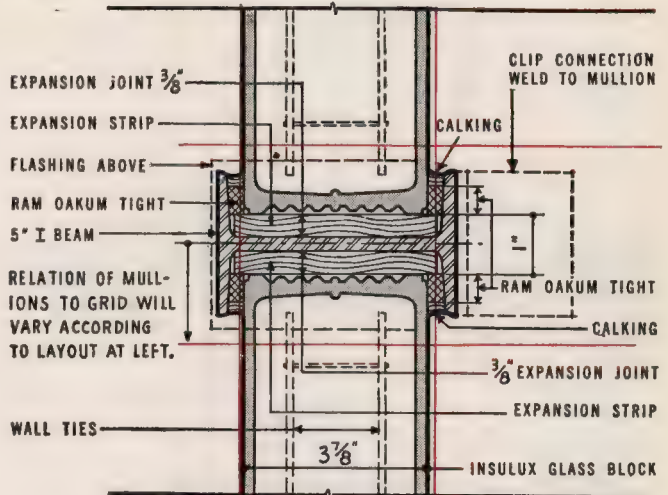
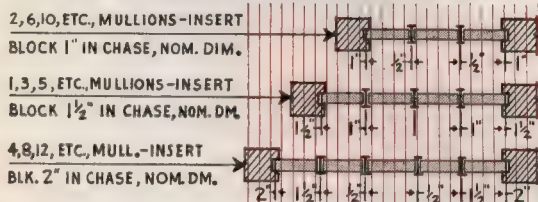
UNIT PANELS



CONTINUOUS PANELS

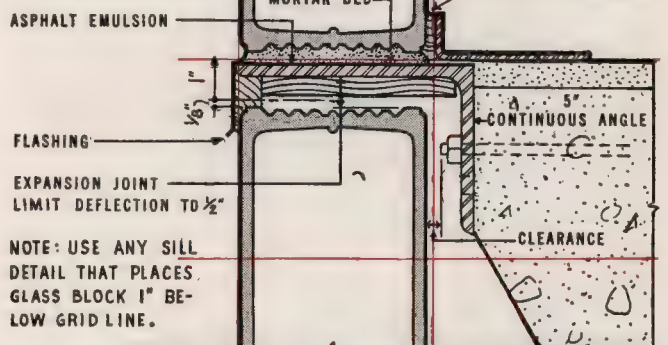


MODULAR MULLIONS-CONTINUOUS PANELS

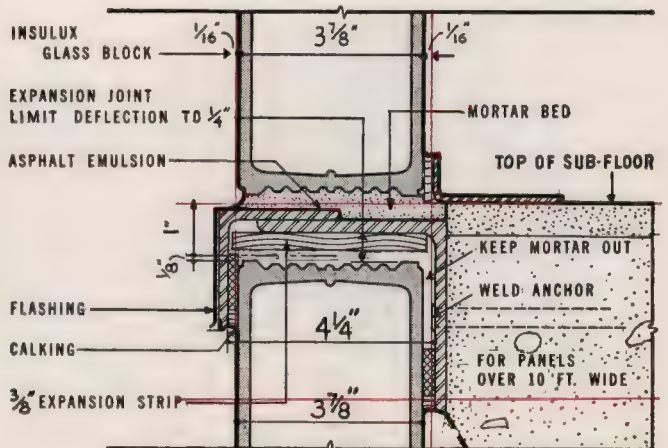


MULLION DETAIL "A"

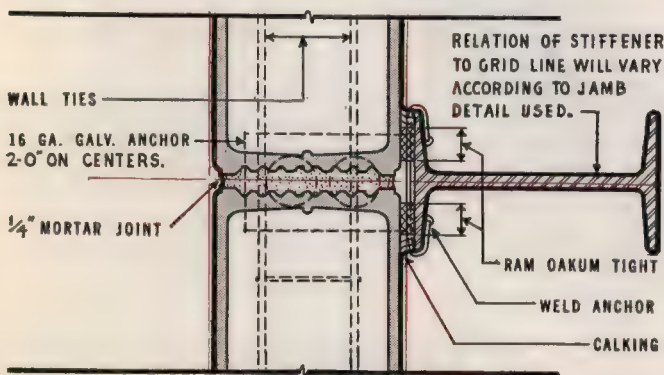
NOTE: USE ANY HEAD DETAIL THAT PLACES BLOCK ON GRID LINE.



SHELF ANGLE DETAIL "B"

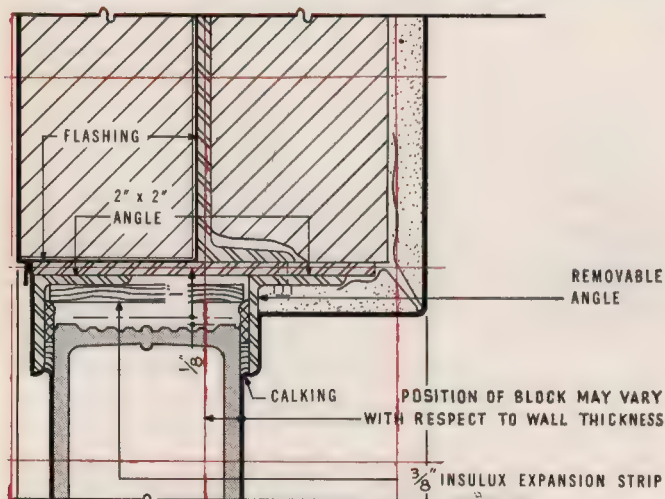


SHELF ANGLE DETAIL "C"

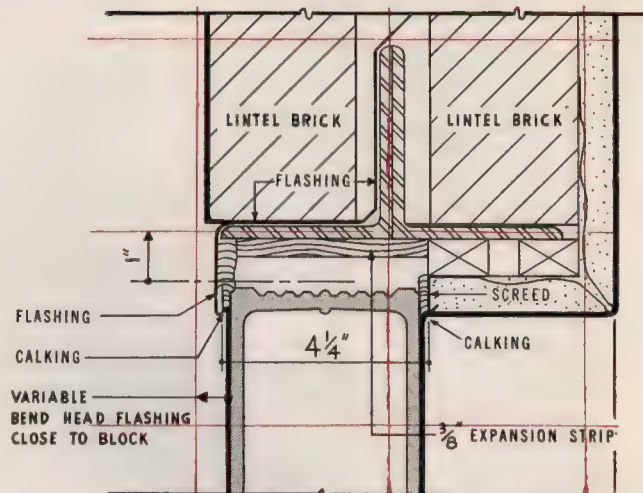


STIFFENER DETAIL "D"

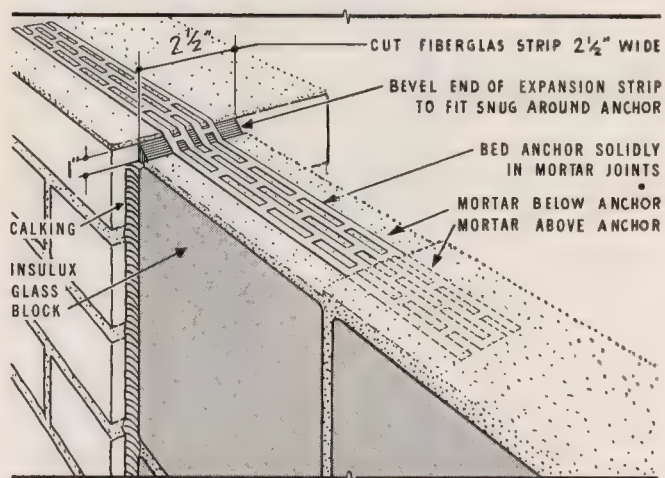
Alternate Details for Small Panels



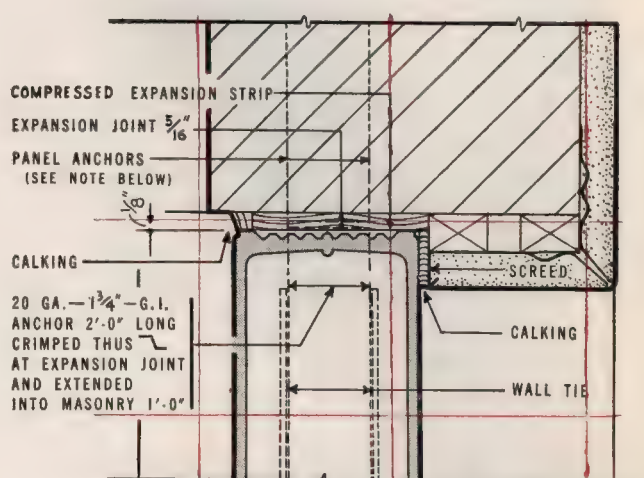
HEAD SECTION "A-1"



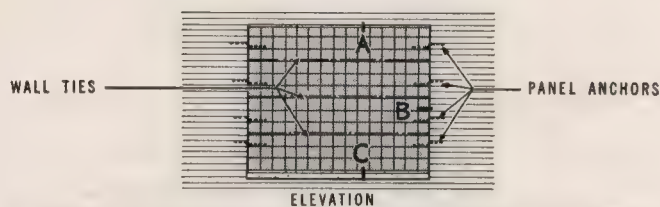
HEAD SECTION "A"



PANEL ANCHOR DETAIL



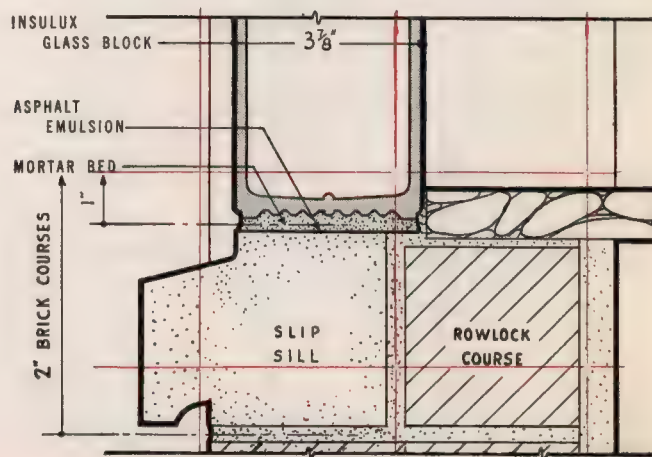
JAMB SECTION "B"



LIMITATIONS WHERE PANEL ANCHORS ARE USED:

MAXIMUM AREA = 100 SQ. FT.
MAXIMUM LENGTH = 10 FEET

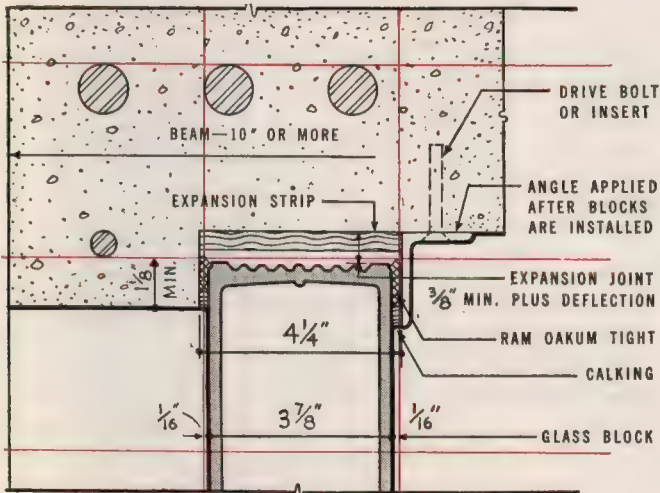
IF PANELS ARE OVER 10 FEET IN LENGTH USE
ALTERNATE HEAD DETAIL A-1



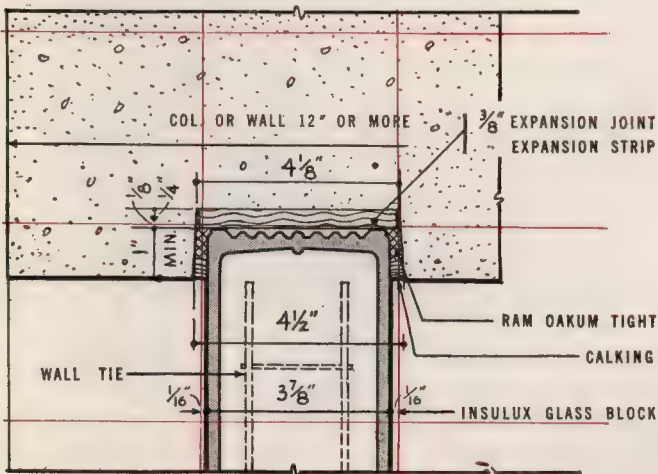
SILL SECTION "C"

INSULUX GLASS BLOCK

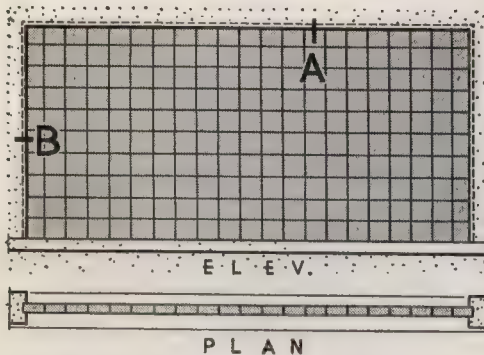
Panels in Concrete Walls



HEAD DETAIL "A"



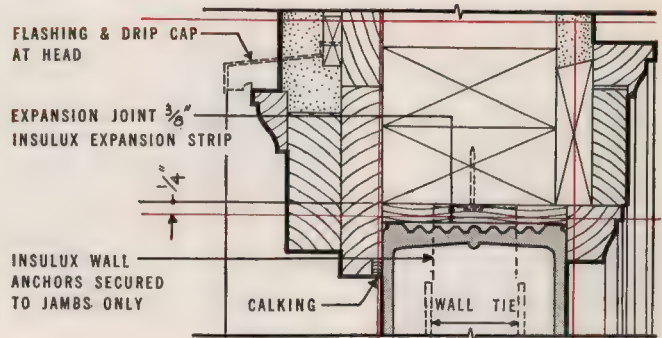
JAMB DETAIL "B"



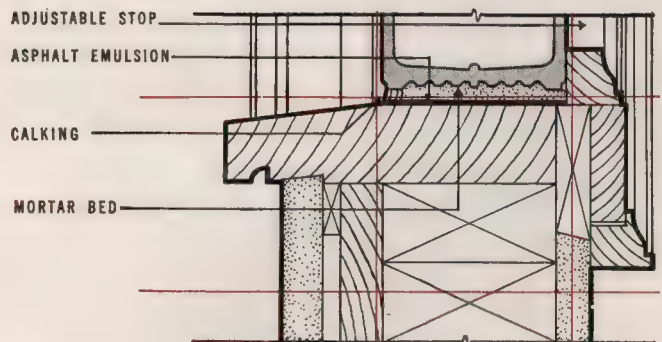
Note: See "intermediate reinforcing", page 17, for large panels and for panel size limitations.

Sill detail may be same as shown on detail "C" panels in 12" walls, p. 15, except panel is on grid lines.

Wood Frame Construction

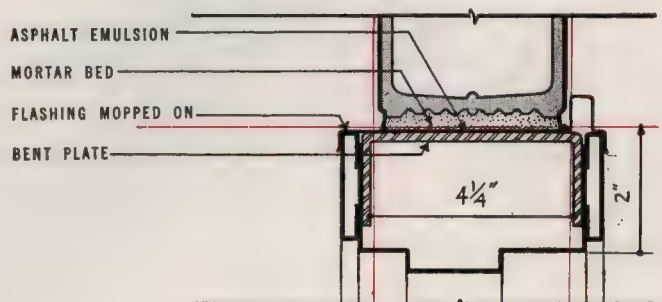


JAMB DETAIL (HEAD SIMILAR AS NOTED)

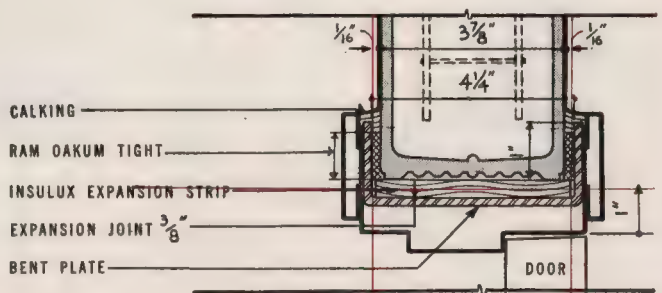


SILL DETAIL

Exterior Metal Door Frames



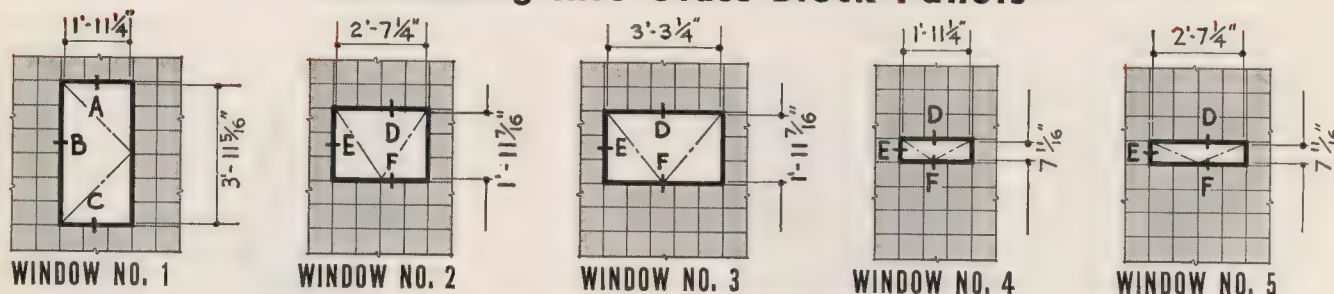
DOOR HEAD



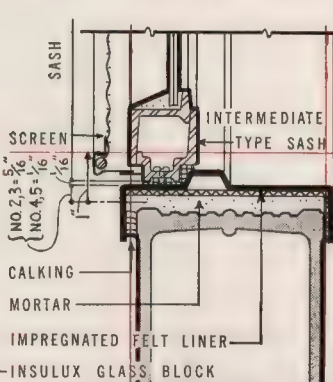
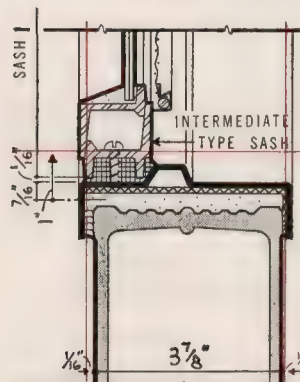
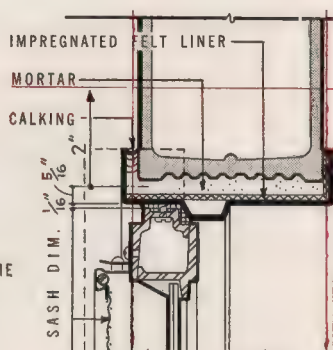
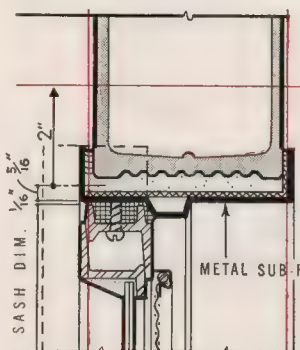
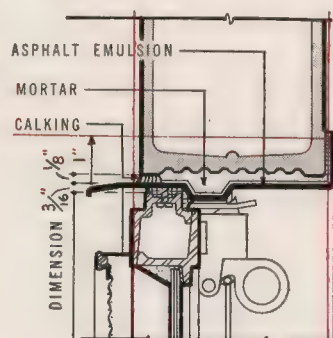
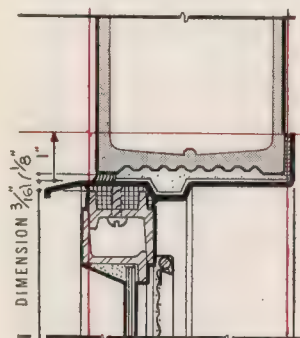
DOOR JAMB

STEEL WINDOW DETAILS

For Setting Into Glass Block Panels



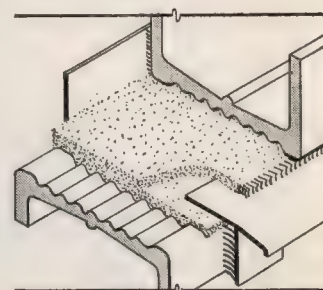
DIMENSIONS SHOWN ARE SASH DIMENSIONS. SUB-FRAMES WILL FIT BLOCK LAID WITH MORTAR JOINTS VARYING FROM 3/16" TO 3/8".



Steel windows for use with glass block are now available through some steel sash manufacturers. Details on these pages show types which have been set up as standard.

Windows on this page

Shown at the left are windows which can be set in glass block panels. They can be furnished complete with sub-frames (including impregnated felt lining and asphalt coating) by sash manufacturers.



Cutaway view of upper corner of window frame showing top flange bedded in mortar at head

Windows No. 2 and No. 3 are intermediate projected types for use with 8" glass block. Window No. 1 is an intermediate casement for use with 6", 8" or 12" block—it is also available 4(8") blocks in width. These windows are for industrial and commercial uses. Windows No. 4 and No. 5 are intermediate types for 8" glass block panels—use for ventilating small rooms.

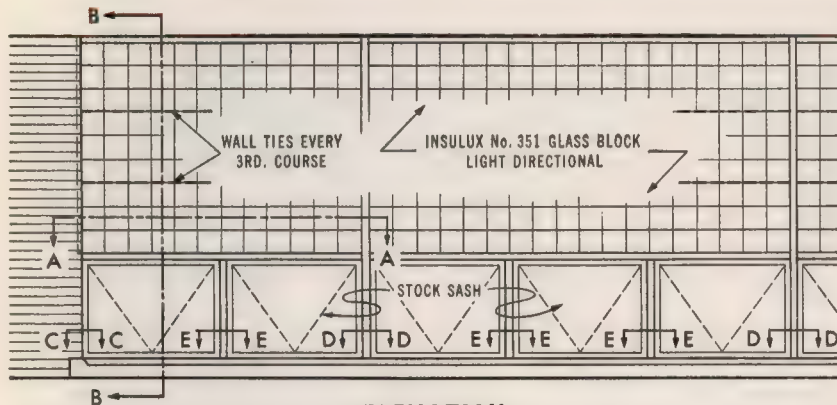
Windows on opposite page

The details on page 21 show windows for use below glass block panels when continuous vision or ventilation is needed.

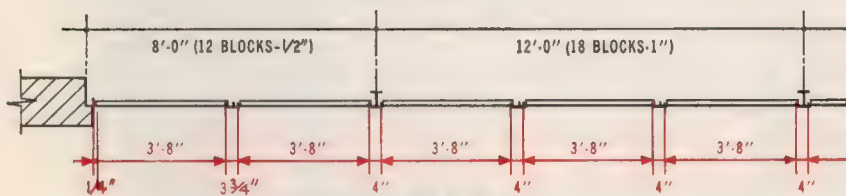
Where Prismatic Blocks (Insulux No. 351) are used above sash, the sight line of the panel sill should not be less than 6'-0" above the floor.

INSULUX GLASS BLOCK

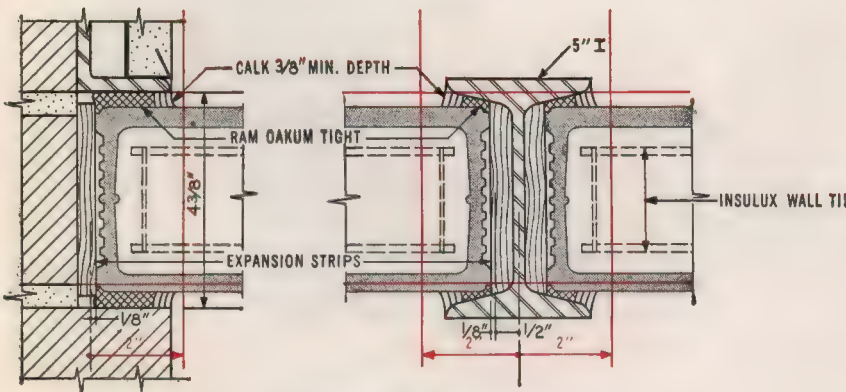
Windows For Use Below No. 351 Glass Block Panels



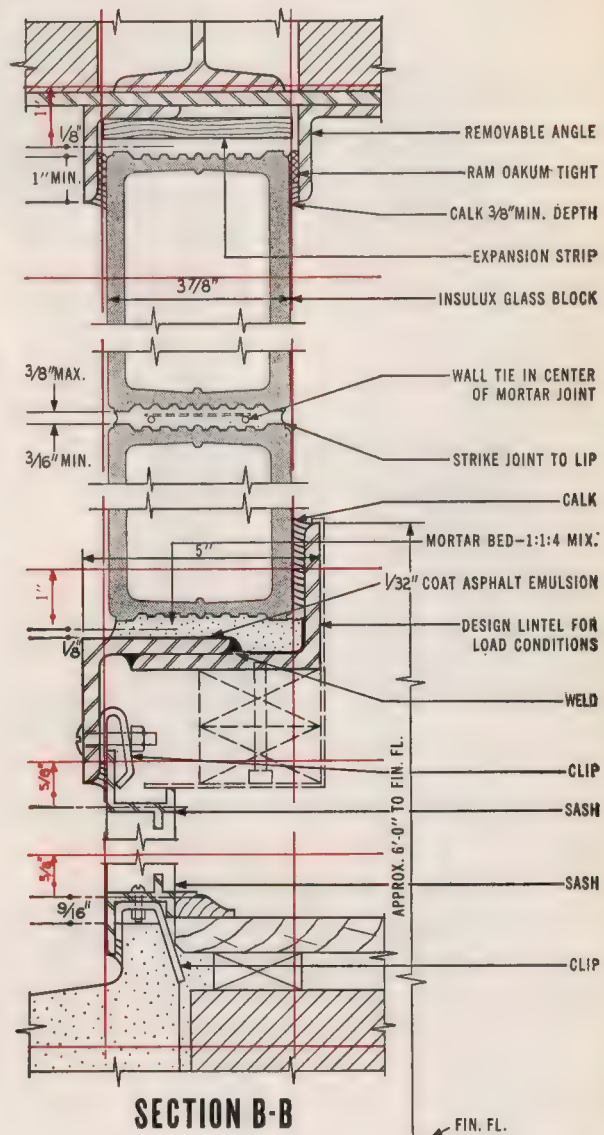
ELEVATION



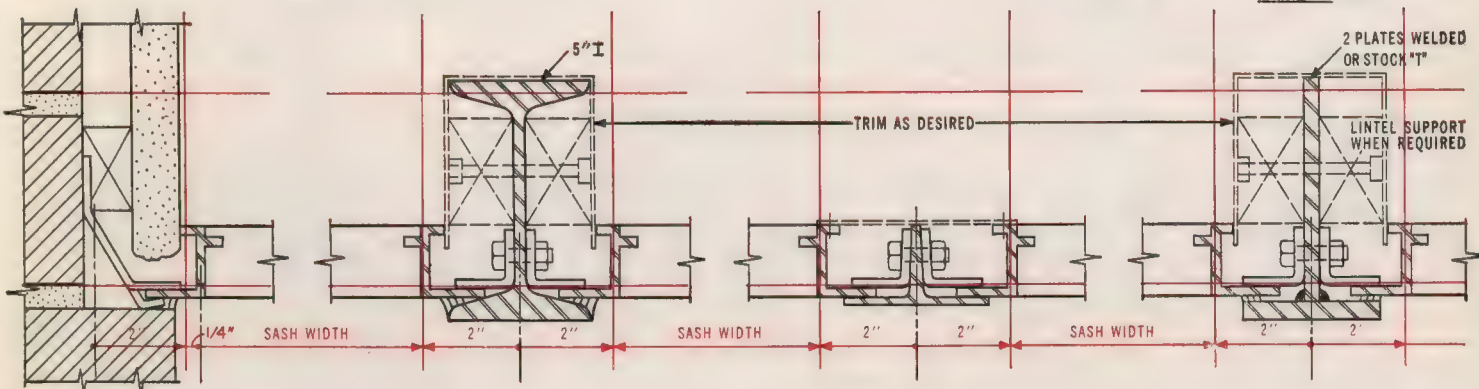
PLAN



SECTION A-A



SECTION B-B



JAMB-C

MULLION-D

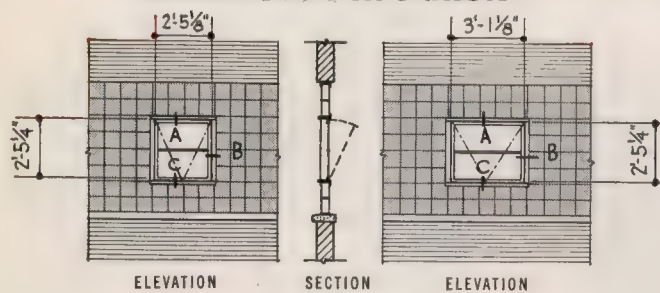
MULLION-E

ALT.STRUCT. MULL.-E

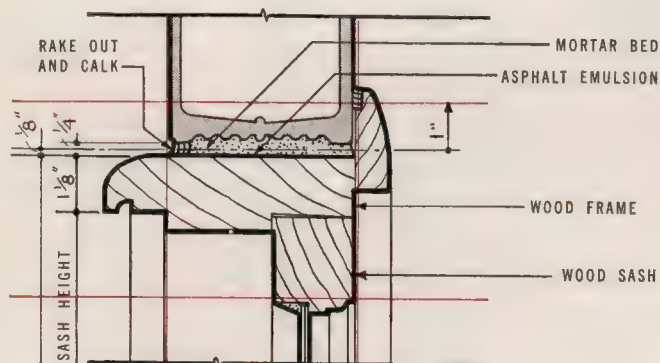
SCALE: $3'' = 1' - 0''$

CONSTRUCTION DETAILS

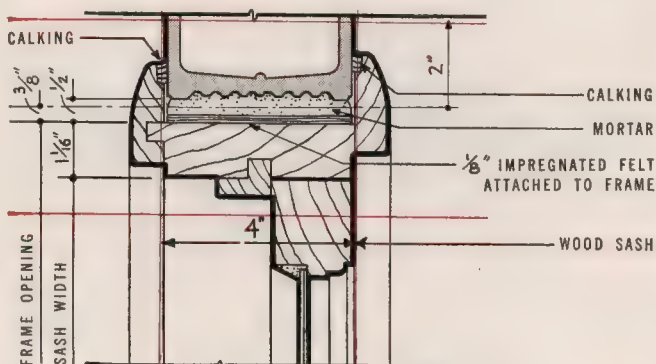
Wood Sash in Panels



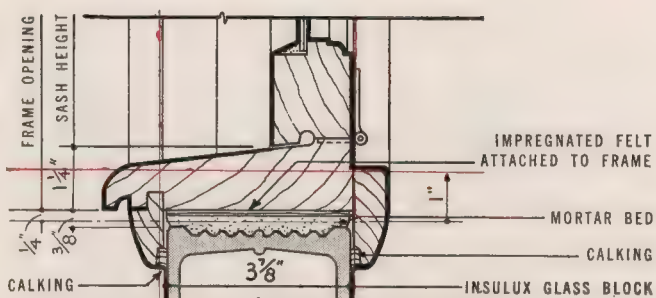
DIMENSIONS SHOWN ABOVE ARE SASH DIMENSIONS
BOTTOM HINGED WOOD SASH



HEAD SECTION "A"

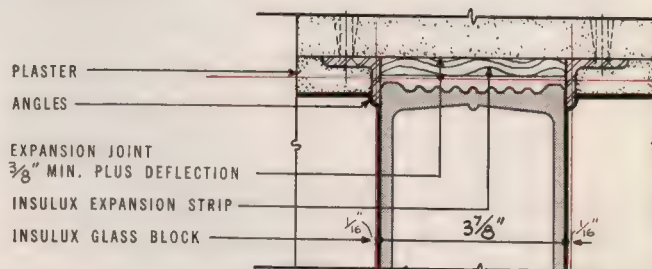
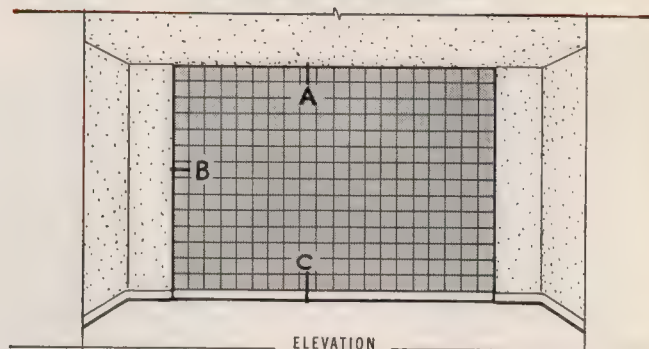


JAMB SECTION "B"

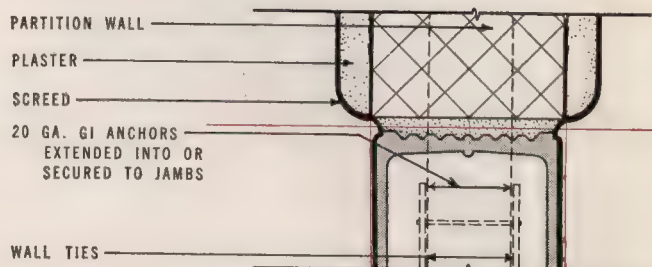


SILL SECTION "C"

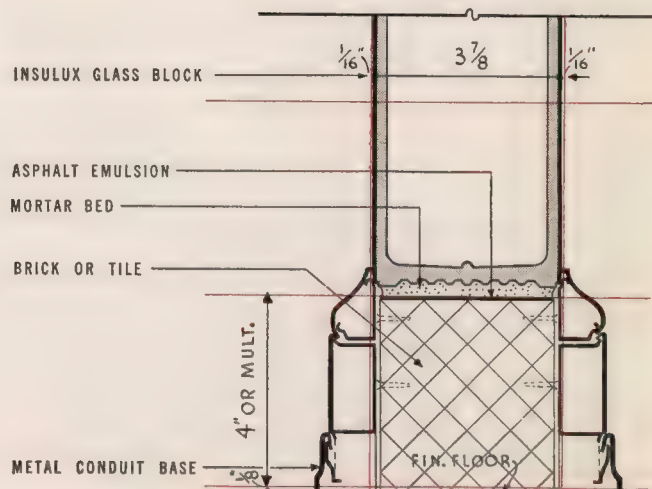
Interior Partitions



HEAD SECTION "A"

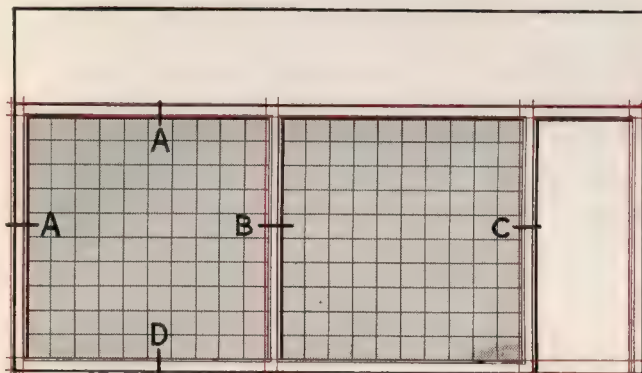


JAMB SECTION "B"



BASE SECTION "C"

Set-in-Wood Construction for Interior Partitions



TYPICAL OFFICE ELEVATION

Details on this page show methods for installing "Insulux Glass Block Set-in-Wood" interior partitions (not for exterior use).

The system is simple, requiring only three basic wood pieces: Continuous strips for horizontal joints; Made-to-length pieces for vertical joints; Wedges for use at jambs and heads to lock panels together.

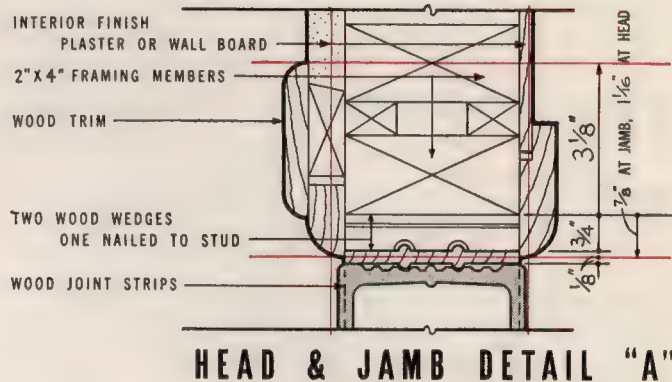
In framing the opening, it is important that rough bucks be sturdily and accurately built. The exact opening sizes are shown in the dimension table below.

Wood parts may be obtained through Insulux Glass Block distributors. They are available only for 8" and 12" block. For more detailed information about this system write American Structural Products Company, Toledo, Ohio.

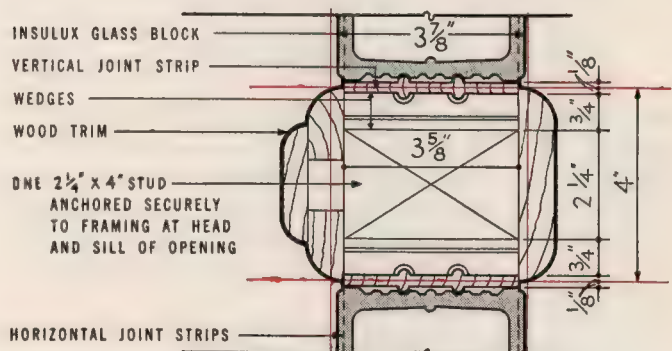
DIMENSION TABLE, "SET-IN-WOOD" CONSTRUCTION

12" BLOCK			8" BLOCK		
No. of BLOCK	OPENING WIDTH	OPENING HEIGHT	No. of BLOCK	OPENING WIDTH	OPENING HEIGHT
1	1'-1 3/4"	1'-1 13/16"	1	9 3/4"	9 3/16"
2	2'-1 3/4"	2'-1 13/16"	2	1'-5 3/4"	1'-5 3/16"
3	3'-1 13/16"	3'-1 1/4"	3	2'-1 3/4"	2'-1 13/16"
4	4'-1 13/16"	4'-1 1/4"	4	2'-9 3/4"	2'-9 3/16"
5	5'-1 13/16"	5'-1 1/4"	5	3'-5 3/4"	3'-5 3/16"
6	6'-1 1/2"	6'-1 5/16"	6	4'-1 3/4"	4'-1 13/16"
7	7'-1 1/2"	7'-1 5/16"	7	4'-9 3/4"	4'-9 3/16"
8	8'-1 1/2"	8'-1 5/16"	8	5'-5 3/4"	5'-5 3/16"
9	9'-1 15/16"	9'-1 3/4"	9	6'-1 3/4"	6'-1 13/16"
10	10'-2"	10'-1 3/4"	10	6'-9 3/4"	6'-9 3/16"
			11	7'-5 3/4"	7'-5 3/16"
			12	8'-1 3/4"	8'-1 13/16"
			13	8'-9 3/4"	8'-9 3/16"
			14	9'-5 3/4"	9'-5 3/16"
			15	10'-1 3/4"	10'-1 13/16"

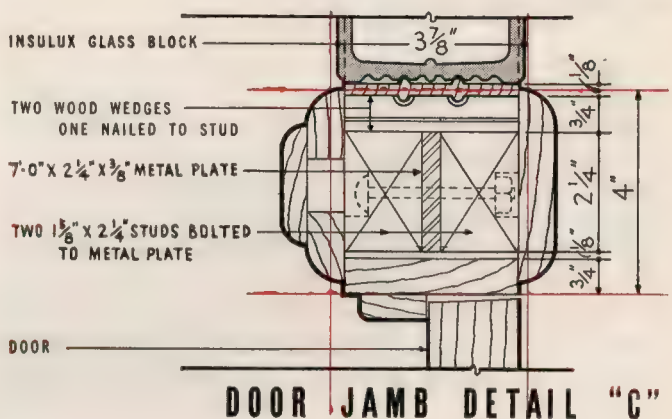
Dimensions given are frame opening dimensions and include clearance at each side and top of panel for wedging. Panel limits—75 sq. ft.—10 ft. in width.



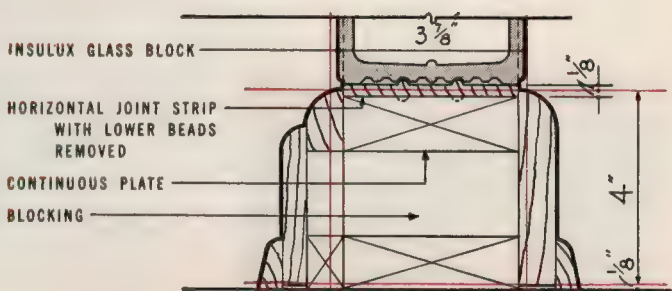
HEAD & JAMB DETAIL "A"



MULLION DETAIL "B"



DOOR JAMB DETAIL "C"



BASE DETAIL "D"

BASIC SPECIFICATIONS

THE following basic specifications are divided into paragraphs with designated letters for convenience. *Specific variations are required for: (1) Fire retardant panels. (2) Erection under jurisdiction of the Pacific Coast Building Officials Conference. Complete information on request.*

Note: The general conditions of the contract are hereby made, by reference, a part of this specification.

Scope: This work consists of furnishing all materials and labor necessary for the complete installation of all glass block as shown on the drawings or as specified hereinafter.

Materials

A. Glass Block shall be hollow, partially evacuated units of water-clear pressed glass as manufactured by American Structural Products Company. Mortar-bearing surfaces shall be precoated with an alkali and moisture resistant grit bearing material, white in color. Glass Blocks shall be Insulux No. as shown on the drawings.

B. Cement shall be Portland cement, complying with the specifications of the American Society for Testing Materials.

C. Lime shall be high calcium, hydrated or well slaked quick lime, complying with A.S.T.M. specifications C6-31 or C5-26. Magnesium hydrated lime may be used if hydrated under steam pressure and if it does not contain more than 8% by weight of unhydrated oxides. 25 lbs. of Quick Lime or 40 lbs. of hydrated shall equal one cubic foot.

D. Sand shall be composed of hard, durable mineral particles free from injurious amounts of organic, alkaline or other foreign materials. It shall be uniformly

graded from fine to coarse with 100% passing a No. 16 sieve.

E. Water shall be clean, non-alkaline and devoid of salts or other injurious elements.

F. Mortar-Mix shall be composed of 1 part Portland cement, 1 part lime and 4 parts of sand, measured by volume. It shall be mixed to a consistency as stiff and dry as possible and still retain good working characteristics.

Setting accelerators or anti-freeze compounds are not to be used.

G. Reinforcing Wall Ties shall consist of two No. 9 wires spaced 2" apart to which are welded No. 14 gauge cross wires. Ties are to be 8 ft. long and not more than .20" thick at the weld. They shall be galvanized or treated with some other approved corrosion resisting coating. Ties are to run continuously with ends lapped 6" and are to be installed in horizontal mortar joints as follows:

No. 200 Series ($5\frac{3}{4}$ " Square)—Every fourth course

No. 300 Series ($7\frac{3}{4}$ " Square)—Every third course

No. 400 Series ($11\frac{3}{4}$ " Square)—Every course.

H. Asphalt Emulsion shall be Insulux emulsion or approved equal and shall be a clay type suspended in water. It shall be used without diluting.

I. Oakum shall be a non-staining type.

J. Caulking where indicated on the drawings, shall be Insulux Caulking Compound or approved equal. It shall be non-hardening and non-staining mastic of gun grade consistency.

Insulux Standard Accessories

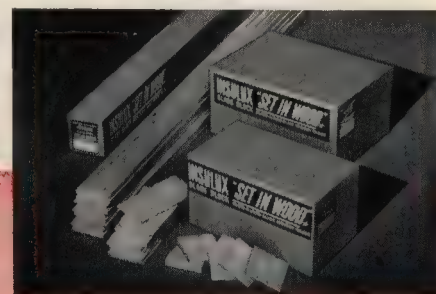
AVAILABLE THROUGH INSULUX DISTRIBUTORS



INSULUX ASPHALT EMULSION.—For application to panel sills. A special asphalt dispersed in water. Available in 5-gallon, 1-gallon and 1-quart cans.



INSULUX CAULKING COMPOUND.—For waterproofing expansion joints of panels. A gun grade non-hardening material, available in $\frac{1}{2}$ -gal., 1-gal. and 5-gal. cans.



"SET - IN - WOOD" STRIPS AND WEDGES.—Horizontal strips 6, 8 and 10 ft. long, 12 to carton. Verticals $7\frac{3}{4}$ " and $11\frac{3}{4}$ " long, 144 to carton. Wedges 72 pairs to carton.

K. Expansion Strips shall be Insulux expansion strips made of fibrous glass or other approved material, bonded together in strips $4\frac{1}{8}" \times \frac{3}{8}" \times 25"$.

L. Panel Anchors (use where panels are not set in chases) shall be made of 20 gauge galvanized perforated steel strips, 24" long and $1\frac{3}{4}"$ wide. They are to be used as shown on the drawings, located in horizontal mortar joints as frequently as wall ties, but not less than two to each jamb.

Erection

A. Panels are to be of size and shape shown on the drawings. Openings for panels shall be formed as detailed and are to be built so that panels will be properly supported against wind pressure. Before laying glass block, sills are to be coated with a heavy layer of asphalt emulsion (at least $\frac{1}{32}"$ thick) the coat being allowed to dry before laying the first mortar bed.

B. Install expansion strips at panel jambs and heads, below shelf angles, at mullions and at any other locations shown on the drawings. These strips are to run continuously and are to be so installed that the edges of the glass block panel (except at sills) do not come in direct contact with the building structure. Expansion strips may be held in place by gobs of asphalt emulsion.

C. Blocks shall be laid plumb, true and level with all mortar joints filled completely with mortar. Do not furrow or "feather" joints. Exposed thickness of mortar joints shall be $\frac{1}{4}"$ for modular system (shown on drawings) but in no case less than $\frac{3}{16}"$ or more than $\frac{3}{8}"$. Do not allow mortar to lodge in expansion joints.

D. Wall ties are to be installed in joints as heretofore specified, imbedding them completely in mortar.

E. Tool the exposed surfaces of the mortar joint to a slightly concave, smooth, non-porous surface after mortar reaches its initial set.

F. Ram oakum between the sides of the block and the sides of the chases after the mortar has set. Ram the oakum back at least $\frac{3}{8}"$ from the finished surface. Fill the recesses thus formed at jambs and head of panels with mastic calking compound, both inside and out, to provide tightly sealed panels.

G. Clean all loose mortar from the panel as the mortar joints are tooled. Final cleaning shall not be done until the mortar has reached its final set.

Alternate for Anchored Panels (Copy paragraphs A, B, C, D, E and G, under "Erection" and include following paragraphs): Where glass block panels are not set in chases but are anchored by panel anchors (see note) standard expansion strips shall be cut to a width of 2" then installed as specified in paragraph B.

Perforated anchors shall be either bolted to or extended not less than 1 foot into masonry jambs. The balance of the anchor is to be imbedded in the horizontal mortar joints of the glass block panels—crimping the anchor at the expansion joint to permit movement. Do not use wire wall ties as anchors.

After the mortar has set, point the exposed surfaces of the expansion joint with mastic calking compound to a depth of not less than $\frac{1}{2}"$.

This method not recommended for large panels or those subjected to severe conditions.

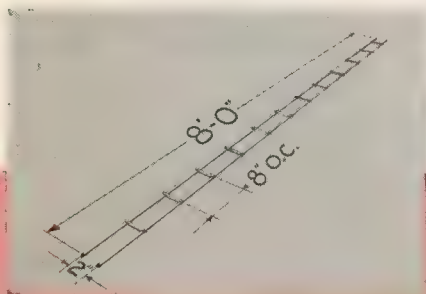
Check-list of materials for construction of typical glass block panels:

By Insulux distributors: Glass blocks, reinforcing wall ties, anchors, expansion strip, mastic calking compound, asphalt emulsion and "Set-in-Wood" strips and wedges.

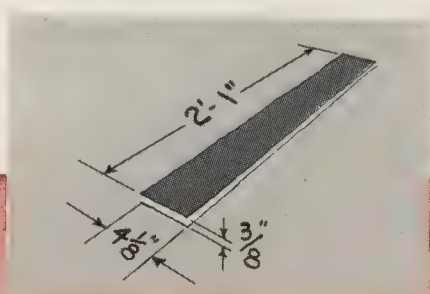
By others: Oakum, metal I beams, channels, T's, etc., wood supports, trim, metal or wood windows, and mortar materials.

Insulux Standard Accessories

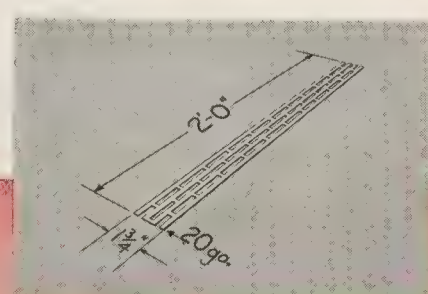
AVAILABLE THROUGH INSULUX DISTRIBUTORS



INSULUX REINFORCING WALL TIES
—Used for reinforcing glass block panels. Made 8' 0" long of No. 9 wires spaced 2" apart by No. 14 cross wires.



INSULUX EXPANSION STRIPS—Required in all expansion joints. Strips are $4\frac{1}{8}" \times \frac{3}{8}" \times 25"$. Made in the form of a resilient glass fiber pad.



INSULUX PANEL ANCHORS—For use only where chase construction is not used. Made of 20 gauge perforated steel, $1\frac{3}{4}" \times 24"$, galvanized after forming.

Light Transmission

Insulux designs No. 7, 16, 17 and 30, transmit approximately 80% of the light measured at normal incidence to their face. Design No. 40, approximately 70%. Light-diffusing and light-directing blocks are not measurable by standard methods.

Underwriter's Test

Insulux glass blocks—tested at the Underwriters' Laboratories in Chicago—withstood a 45-minute fire and hose test and were accorded a "Class F. opening" rating for light-fire exposures. Blocks tested were Numbers 207, 216, 217, 230, 240, 307, 316, 317, 330, 340, 350, 351 and 354.

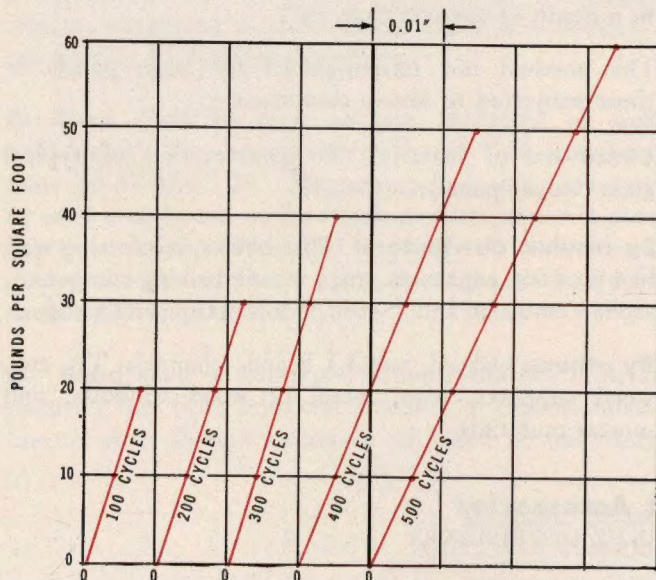
Sound Reduction

Glass block panels have an average sound reduction factor of 40.7 decibels (over nine frequencies). This is slightly better than 4" tile wall, plastered on two sides.

Weight Per Sq. Foot

Varying slightly with the different patterns and sizes, the weight of Insulux panels is approximately 17.5 lbs. per sq. ft.

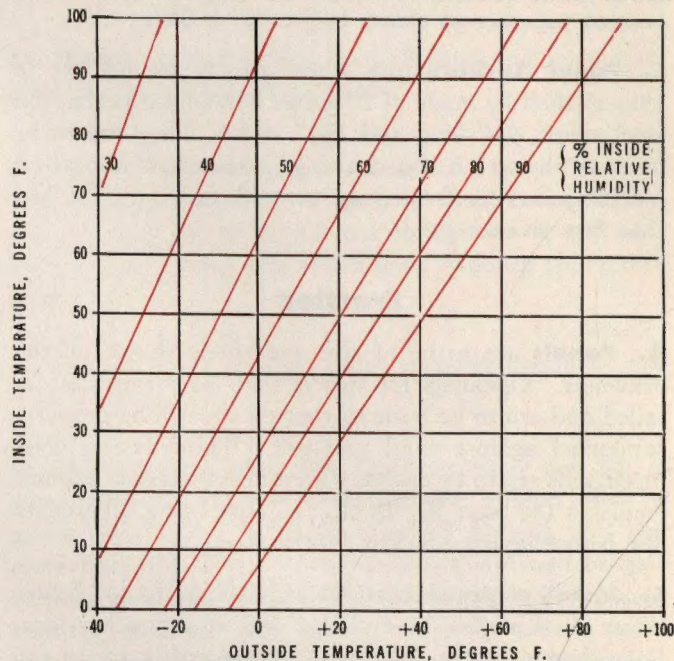
Wind Pressure Tests



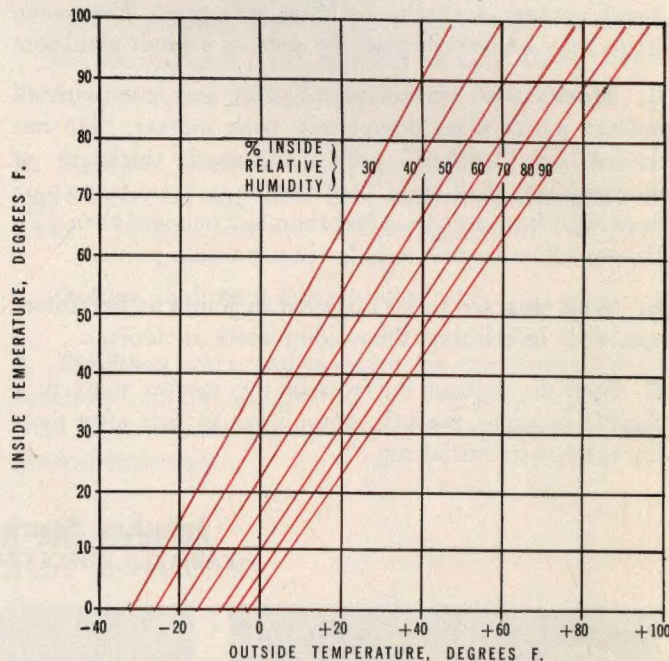
A 7'-3" x 8'-8" Insulux glass block panel tested at Materials Testing Laboratory, Purdue University, proved entirely elastic under pressure of 40 lb. per sq. ft. (equal to wind velocity of 115 m.p.h.). Final failure occurred at pressure equal to a 174 m.p.h. wind. The chart above shows successive results at end of each 100 cycles of pressure—up to 500 cycles.

Surface Condensation

● INSIDE SURFACE CONDENSATION POINTS FOR GLASS BLOCK



● INSIDE SURFACE CONDENSATION POINTS, SINGLE GLAZING



The charts above show a lower outside temperature is required to produce condensation on a glass block panel than on a single glazed window. Important in all buildings but particularly so where high humidities prevail—as swimming pools, paper mills, textile mills, etc.

Wall 3/8"
Wall 3/8"
Hollow 3 1/8"
Total 3 7/8"

Solar Heat Gain

Heat gain through Glass Block: The table below shows the results of the latest tests(*) on heat gain through glass block panels. The figures shown are average for most glass block face designs (**). Prismatic types have somewhat lower values.

		SOLAR RADIATION HEAT GAIN (Direct plus Sky Btu per Sq. Ft. per Hour						TOTAL HEAT GAIN ² (Solar Radiation Plus Normal Transmission) Btu per Sq. Ft. per Hour						
Side	East ³	West ³	South					East ³	West ³	South				
N. Latitude Degrees	40	40	30	35	40	45	40	40	30	35	40	45		
7:00 74	65.0		1.0	2.8	3.0	5.0	61.0		-4.5	-2.0	-0.5	1.0		
8:00 76	63.0	0.0	3.0	4.4	6.5	11.0	77.5		0.0	2.0	4.0	5.0		
9:00 79	40.0	5.0	5.5	7.1	10.2	13.4	73.5	5.0	5.0	7.0	10.0	12.0		
10:00 83	24.0	6.0	8.5	11.3	14.7	17.1	57.5	6.5	11.0	15.0	18.0	20.8		
11:00 87	15.5	7.0	12.0	15.2	18.7	21.8	45.0	7.5	16.5	22.0	25.5	32.0		
12:00 90	10.0	10.0	14.0	17.4	21.0	24.8	36.5	10.5	21.5	28.0	33.8	40.8		
1:00 93	7.0	15.5	12.0	15.2	18.7	21.8	30.0	22.0	25.0	31.8	38.5	46.0		
2:00 94	6.0	24.0	8.5	11.3	14.7	17.1	24.0	35.0	26.0	32.0	39.0	47.0		
3:00 95	5.0	40.0	5.5	7.1	10.2	13.4	19.5	55.0	24.0	29.8	36.5	45.0		
4:00 95	4.5	65.0	3.0	4.4	6.5	11.0	15.5	77.0	20.0	25.5	31.5	40.5		
5:00 93	4.0	63.0	1.0	2.8	3.0	5.0	12.5	85.5	15.0	20.0	25.2	33.5		
6:00 91	2.5	23.5	0.0	0.7	0.7	3.0	10.5	55.0	9.5	13.5	18.0	25.5		
7:00 89	1.5	0.0		0.0	0.0	0.7	8.0	18.5	3.5	7.0	11.0	18.0		

Sun Time

Outside Temp. (F.)

For August 1.

² Inside temperature, 78 F.

³ For east and west walls these values can be applied to all latitudes between 30 and 45 degrees N. without excessive errors.

For August 1.

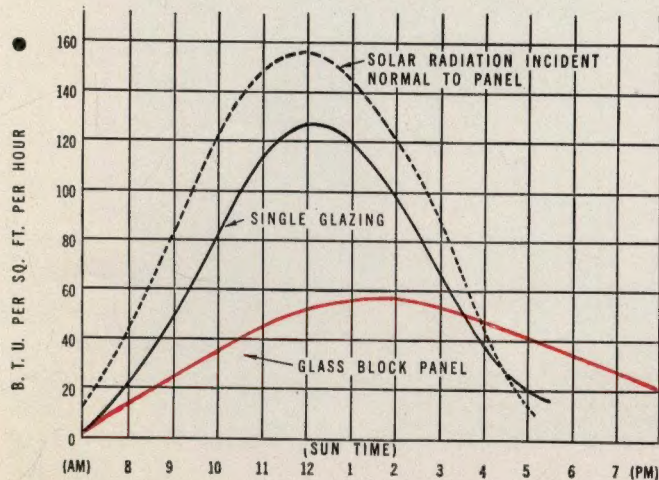
² Inside temperature, 78 F.

³ For east and west walls these values can be applied to all latitudes between 30 and 45 degrees N. without excessive errors.

(*) Reported in the paper "Heat Gain Through Glass Blocks by Solar Radiation and Transmittance" by F. C. Houghton, David Shore, H. T. Olson and Burt Gunst (see page 264, April 1940 H.P. & A.C.)

(**) Dimensions of blocks tested $7\frac{3}{4}" \times 7\frac{3}{4}" \times 3\frac{7}{8}"$.

Glass Block compared to single glazing: The chart below compares heat gain through a glass block panel with that through a single glazed window. Tests conducted August 29, 1939—South Exposure.



Thermal Insulation

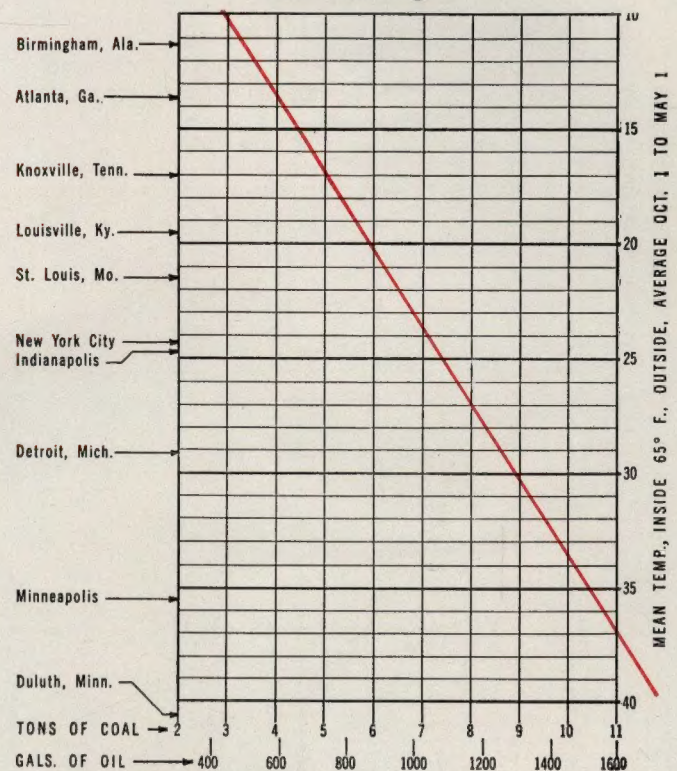
Thermal conductivity tests run at nationally recognized laboratories and confirmed by official tests at the Pittsburgh Testing Laboratories, give the values quoted below for the overall heat transfer coefficient (U.*) through glass block panels.

U-Values

Type of Block	Still Air	15 mph wind
Ribbed-face:	U—0.38	U—0.46
Smooth-face:	U—0.40	U—0.49

*B.T.U. per sq. ft. per hour per degree F. difference in temperature.

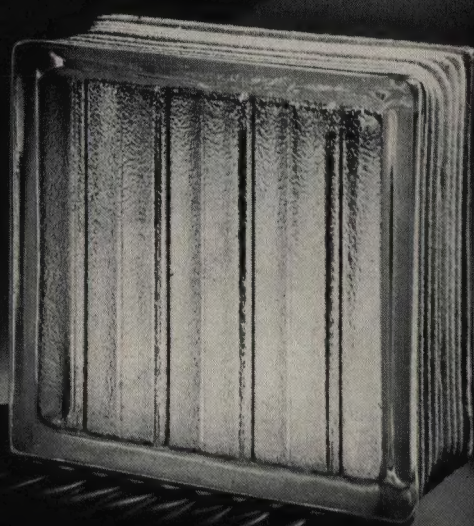
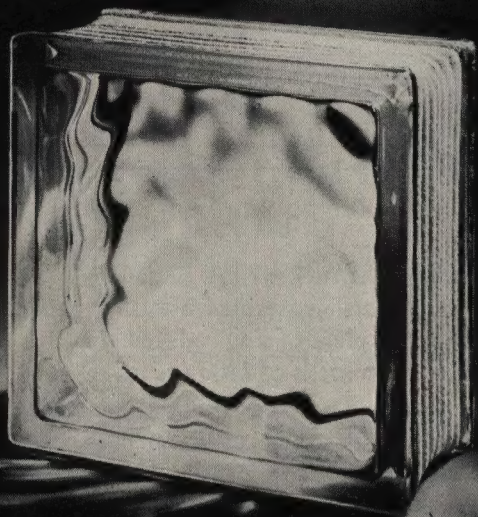
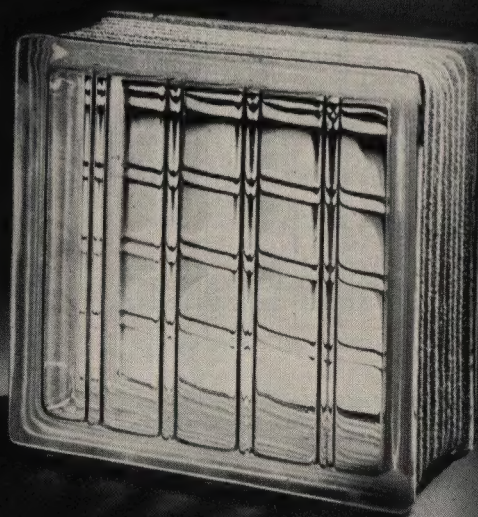
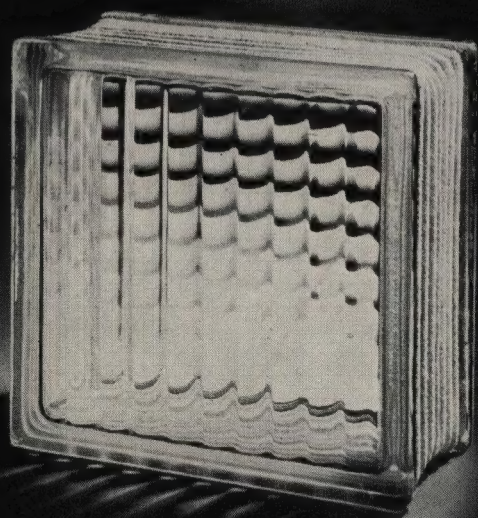
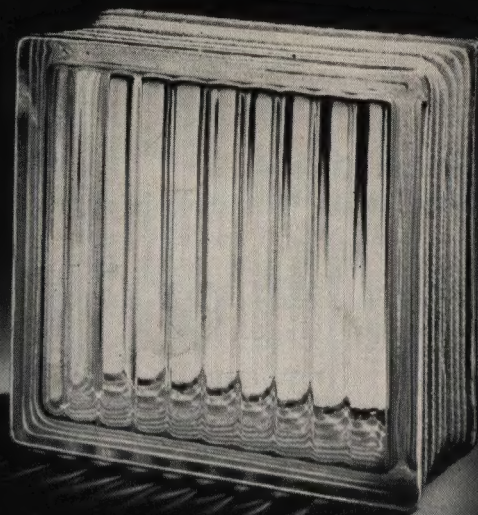
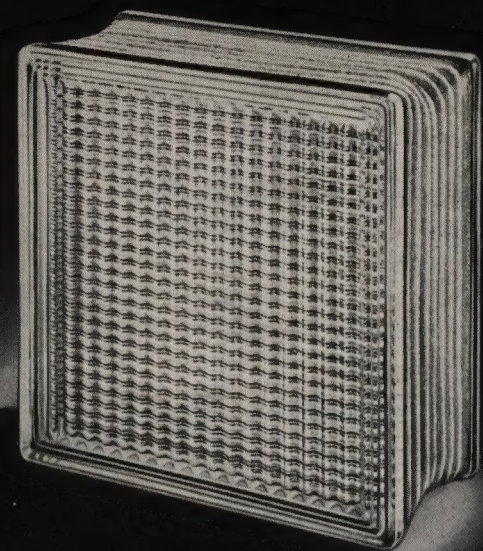
Fuel Savings



The above chart shows the fuel savings in gallons of oil and tons of coal which can be attained by using panels of Insulux Glass Block in place of single glazed windows. Figures are based on glass areas of 1000 sq. ft.

These heat loss calculations were based upon conduction through glass areas only, all other factors such as walls, roof and infiltration were ignored.

Calculations were based on the following factors: U value Sash, 1.13; U value Glass Block, .49; inside temperature 65 degrees. Outside temperature were averages taken for various localities from October 1 to May 1. Still air inside, 15 MPH wind outside 12,000 B. T. U. per lb. coal at 60% efficiency; 140,000 B. T. U. per gal oil at 70% efficiency.



AMERICAN STRUCTURAL PRODUCTS COMPANY, TOLEDO 1, OHIO ★ ★ ★

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